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Bureau canadien de la sécurité aérienne

Aviation Occurrence Reports

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AVIATION OCCURRENCE REPORTS

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FOREWORD

AVIATION OCCURRENCE REPORTS

In accordance with the CASB Act, part of the Board's objective is to report publicly on its investigations, on the related findings, and on any recommendations designed to eliminate or reduce safety deficiencies.

The AVIATION OCCURRENCE REPORTS Publication contains reports on CASB investigations, findings, and recommendations adopted by the Board and occurrence briefs. The sole intent in providing this information is to advance aviation safety. It is not the object of the Board to determine or apportion any blame or liability in connection with aviation occurrences.

Anyone wanting to employ the AVIATION OCCURRENCE REPORTS for purposes other than advancing aviation safety could find the information incomplete.

This publication is also available in French.

A limited number of copies of this publication are retained and are available from:

Canadian Aviation Safety Board
P.O. Box 9120 Alta Vista Terminal
Ottawa, Ontario
KIG 3T8

Cette publication est également disponible en français.

On peut obtenir des exemplaires de la présente publication en nombre limité auprès du:

Bureau canadien de la sécurité aérienne
C.P. 9120 Terminal Alta Vista
Ottawa (Ontario)
KIG 3T8

This publication contains reports of aviation occurrences, in Canada, involving Canadian or foreign-registered aircraft.

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EXPLANATORY NOTES

TYPES OF REPORTS

The CASB currently produces four types of occurrence reports: there are three investigation report formats and the brief. The most common investigation report format is the Summary Report which summarizes the details of the investigation in one or two pages. Intermediate Reports are somewhat longer and more detailed. For both these types, the complete public report is reproduced in this publication. More factual information is available on Summary and Intermediate Reports and can be obtained by contacting the CASB and referencing the report number. A small number of investigations (generally 15 to 20 per year) result in International Civil Aviation Organization (ICAO) format reports. For the latter type of report, only the Synopsis and the Conclusions and Recommendations sections of the report are included in this publication. The full report can be obtained by contacting the CASB and referencing the report number (which is included with the Synopsis). An aviation occurrence brief is a short narrative history of the flight and occurrence. It includes pertinent information based on a report by the pilot or operator of the aircraft. Laboratory reports, if laboratory analysis has been carried out, are available for all three categories of reports and can be obtained in the same manner.

GROUPING OF REPORTS

For ease of reference, the reports in this publication are grouped by broad category of aircraft type and by type of operation within each group. The reports are then presented chronologically (by the date of the occurrence) within each subgroup.

For fixed-wing conventional aircraft, the first subgroup is Public Transportation. This includes scheduled, other unit toll, and charter operations. Note that this subgroup is further divided into occurrences involving (i) aircraft of 5 700 kg (12,500 lb) or over and (ii) aircraft under 5 700 kg (12,500 lb). The second subgroup is Commercial Training. This includes licensed flying clubs and commercial specialty training (commercial licence classes 6 and 7, respectively). All other types of fixed-wing aircraft commercial operations are grouped under Other Commercial Operations. The Private aircraft subgroup includes all privately registered aircraft, both personal and corporate. It is further subdivided according to type of landing gear. The final subgroup contains occurrences involving state-owned aircraft.

For the rotary-wing category, there are fewer aircraft and fewer occurrences. Thus, only three subgroups are used, viz. Commercial, Private, and State.

The final category contains reports and briefs for all other types. This includes amateur-built aircraft, ultralights, gliders, balloons, etc.

CONTENTS OF SUMMARY REPORTS AND INTERMEDIATE REPORTS

Information on Aircraft:

The first block of each report identifies the type of aircraft involved in the occurrence, the model, the registration, the location, and the date of the occurrence; for commercially operated aircraft, the operator is also identified.

Occurrence Report Number:

The second block commences with the occurrence report number (any queries to the CASB should carry this reference). The first two numbers identify the year of the occurrence, the first letter identifies the CASB office that conducted the investigation ('A' - Atlantic, ' Q' - Quebec, 'O' - Ontario, 'C' - Central, 'W' - Western, 'P' - pacific, 'H' - Head Office). The first number after the letter identifies the year of the decade of the occurrence. This block also contains information on the type of investigation (a correspondence investigation is one in which the site of the occurrence was not visited by a CASB investigator), the time of the occurrence, the type of operation, the extent of damage to the aircraft, and the type of licence held by the pilot.

Pilot Hours:

This block indicates the total number of hours the pilot had acquired on all types of aircraft, the total number of hours on type, and the number of hours flown in the last 90 days (in total and on type).

Injuries:

The injuries sustained by the crew, passengers, or others are classified as Fatal, Serious, or Minor/None (See Definitions).

Summary Report Narrative:

The narrative summarizes the history of the flight, pertinent factual information and analysis. The narrative is divided into two parts:

(a) the factual information or a description of what happened, which begins with a description of the history of the flight as close as possible to the occurrence, followed by the pertinent information; and

(b) an analysis of why the occurrence happened.

Reported Circumstances: (Briefs only)

The narrative summarizes the pertinent information based on a report by the pilot or operator of the aircraft.

Findings: (Reports only)

The Board's findings from an investigation are grouped under two subheadings, as follows:

Cause-Related Findings: Any element of the occurrence, found during the investigation which, if removed, would have prevented the occurrence, or, if removed, would have avoided or reduced damage to property and people.

Other Findings: Information, discovered during the investigation of an occurrence, which is not cause related but has the potential to enhance or degrade aviation safety.

Safety Action:

For all aviation occurrence investigations, relevant data are recorded to facilitate statistical analysis and the identification of system-wide safety deficiencies through safety studies. In cases where an individual occurrence investigation leads to significant safety action being taken, that action is included in the public report immediately after the Findings.

DEFINITIONS

(Extracted from the Canadian Aviation Safety Board Act/Regulations)

"AVIATION OCCURRENCE"

(a) any accident or incident associated with the operation of aircraft, and

(b) any situation or condition that the Board has reasonable grounds to believe could, if left unattended, induce an accident or incident described in paragraph (a).

"ACCIDENT"

"ACCIDENT" means any aviation occurrence where, at any time during the period commencing when the first person boards an aircraft for the purpose of flight and ending when the last person disembarks from the aircraft after the flight,

(a) a person other than a stowaway, sustains a serious injury or fatal injury, that is not self-inflicted or inflicted by another person or caused by natural causes, as a result of that person

i) being in the aircraft,

ii) coming in direct contact with any part of the aircraft, including any part that may have become detached from the aircraft, or

iii) being directly exposed to the jet blast of the aircraft,

(b) the aircraft sustains damage or structural failure adversely affecting the structural strength, performance or flight characteristics of the aircraft and normally requiring major repair or replacement of any affected component part, other than damage or failure that is limited to

i) the engine, its cowling, or its accessories,

ii) the propellers, wing tips, antennae, tires, brakes or fairings, or

iii) small dents or puncture holes in the aircraft skin, or

(c) the aircraft is missing or is completely inaccessible.

"SERIOUS INJURY"

"SERIOUS INJURY" means an injury that is sustained by a person in an accident and that

(a) requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was sustained,

(b) results in a fracture of any bone, other than a simple fracture of the nose or of any fingers or toes,

(c) involves lacerations that cause severe haemorrhage or nerve, muscle or tendon damage,

(d) involves injury to any internal organ, or

(e) involves second or third degree burns, or any burns affecting more than five per cent of the body surface.

"INCIDENT"

"INCIDENT" means an aviation occurrence, other than an accident, that affects or could affect the safe operation of an aircraft. Incidents can be reported to the CASB through mandatory or voluntary reporting mechanisms.

According to the CASB regulations a "reportable incident" means any incident involving an aircraft with a maximum certified take-off weight greater than 5 700 kg where

(a) an engine fails,

(b) smoke or fire occurs, other than an engine fire that is contained within the engine and does not result in engine failure or damage to other component parts of the aircraft,

(c) difficulties in controlling the aircraft in flight are encountered due to any aircraft system malfunction, weather phenomena, wake turbulence, operations outside the approved flight envelope, or uncontrolled vibrations,

(d) the aircraft fails to remain within the intended landing or take-off area, lands with one or more landing gear retracted, or drags a wing tip or engine pod,

(e) any crew member is unable to perform his flight duties as a result of incapacitation,

(f) decompression, explosive or otherwise, occurs that necessitates an emergency descent,

(g) a fuel shortage occurs that necessitates a diversion or requires approach and landing priority at the destination of the aircraft,

(h) the aircraft is refuelled with the incorrect type of fuel or contaminated fuel that is undetected prior to departure from the ramp,

(i) a collision or risk of collision with any other aircraft or with any vehicle, terrain or obstacle occurs, including a collision or risk of collision that may be related to air traffic control procedures or equipment failures,

(j) a flight crew member declares an emergency or indicates any degree of emergency that requires priority handling by an air traffic control unit or the standing by of a crash, fire fighting or rescue services, or

(k) toxic gases or corrosive materials leak from any cargo aboard the aircraft.

* * * * *

AIR CANADA
BOEING 727 C-GAAL
LYTTON, BRITISH COLUMBIA
18 AUGUST 1985

REPORT NUMBER: 85-P54026 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1410 PDT
OPERATION: Scheduled Domestic
DAMAGE: None
PILOT LICENCE: Airline Transport

PILOT HOURS:	CAPTAIN		FIRST OFFICER	
	ALL TYPES	ON TYPE	ALL TYPES	ON TYPE
TOTAL	14,000	1,200	7,600	4,000
LAST 90 DAYS	150	150	180	180

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	7
PASSENGERS	-	-	110

SUMMARY REPORT:

About 20 minutes after take-off from Victoria, as the aircraft approached the assigned altitude of flight level 330, the first officer said that he did not feel well. He had chest pains and felt very warm. He moved his seat aft, took a few breaths from the oxygen mask, and, a few seconds later, lapsed into unconsciousness. The captain reversed course and landed uneventfully at Vancouver. Flight attendants and a doctor cared for the first officer, and he regained consciousness during the latter portion of the descent.

Although the first officer was subjected to extensive medical testing and examinations, there was no reason determined for his feeling ill or loss of consciousness. His workload over the preceding three weeks had been heavy but was within Air Canada and Transport Canada guidelines. The first officer had not previously experienced any medical problems during flight.

FINDINGS:

Cause Related:
1. The first officer became ill and lost consciousness in flight for undetermined reasons.

Other:
- Nil -

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AIR INUIT LIMITED
GRUMMAN G159 C-GMJS
HAMILTON CIVIC AIRPORT, ONTARIO
12 NOVEMBER 1985

REPORT NUMBER: 85-O54157 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2130 EST
OPERATION: Regular Specific Point
DAMAGE: None
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	8,500	400
LAST 90 DAYS	200	200

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	3
PASSENGERS	-	-	8

SUMMARY REPORT:

The aircraft, which was on a scheduled flight to Hamilton, Ontario, was dispatched from Ottawa, Ontario with the anti-skid braking system unserviceable. Approaching Kleinburg, the flight was cleared to Hamilton and was passed the latest weather. The Hamilton weather was reported as indefinite ceiling zero feet obscured and visibility one-eighth of a mile in light drizzle and fog. The crew decided to hold at Hamilton for 20 minutes and then, if there was no improvement in the weather, proceed to Toronto. At 2100 eastern standard time, the Hamilton weather was reported as indefinite ceiling 100 feet obscured, visibility one-quarter of a mile in drizzle and fog. At that time, the crew requested clearance for an instrument landing system (ILS) approach to Hamilton. The crew carried out a missed approach on the first attempt and landed off the second approach; however, they were unable to stop the aircraft on the runway, and it slid off the end of the runway. The runway was wet and covered with coarse sand that had been put on the runway after a previous snowfall.

The published approach minimums for the ILS at Hamilton are ceiling 200 feet and visibility three-quarters of a mile. Provided that there is no runway visual range (RVR), an approach is permissible when conditions reported are below published limits. There is no RVR equipment installed at Hamilton.

On the first approach, the crew stated that they saw the approach lights above minimums, but, because they were not properly aligned with the runway at minimums, they commenced a missed approach. On the second approach, the crew stated they had difficulty ascertaining their height above the runway and, as a result, landed long. The aircraft's tracks, which were clearly visible, indicated that 2,674 feet of the 6,000-foot runway remained after touchdown. Although aware that the aircraft had touched down long, the crew felt there was sufficient runway remaining on which to stop. However, because the wet runway was covered with sand, and because the anti-skid system was unserviceable, there was limited braking action available. It was also determined that the crew had not asked for a runway condition report prior to landing; so they were not aware of the runway conditions.

FINDINGS:

Cause Related:

1. The crew, although they had difficulty ascertaining their height above the runway, did not overshoot and landed long.

2. The wet and sandy runway and the lack of a serviceable anti-skid system prevented the aircraft from braking to a stop within the remaining runway length.

Other:
-Nil-

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EASTERN PROVINCIAL AIRWAYS
HAWKER SIDDELEY HS748 C-GDOP
MONCTON, NEW BRUNSWICK
14 JANUARY 1986

REPORT NUMBER: 86-A64006 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1754 EST
OPERATION: Scheduled Domestic
DAMAGE: Minor
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	6,015	1,821
LAST 90 DAYS	175	175

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	3
PASSENGERS	-	-	40

HISTORY OF THE FLIGHT:

As the aircraft was rotated on take-off, the crew felt a surge of power, and the left engine lost power. At the same time, the left engine fire warning light came on. The appropriate drills were carried out, the fire was extinguished, and the left engine was shut down.

The take-off was completed, and a single-engine circuit and landing were carried out. The aircraft was taxied to the terminal, and the passengers deplaned.

PERTINENT INFORMATION:

A visual examination showed that a hole had erupted through the side of the number five combustion chamber assembly on the left engine and that fire had burned through the adjacent engine cowling.

The combustion chamber assembly was removed, and it was determined that the three flame tube suspension pins and liners were extensively worn, allowing the flame tube to move forward within the combustion chamber assembly.

The head of the flame tube contacted the fuel burner pipe in the expansion chamber and wore a 0.035-inch diameter hole through it. This allowed unatomized fuel under pressure to be released into the outer chamber of the combustion chamber assembly with resultant overheating and excessive pressure, causing the flame tube and outer casing to erupt. The outer casing of the fuel heater adjacent to the hole in the number five combustion chamber was burned through, and the inner heat exchanger wall was scorched.

Rolls Royce Service Bulletin DA72-423, Engine-Combustion Equipment-Fitment of Snubber Screws to Expansion Chambers for Flame Tube Head Location - Mod. 1736, was introduced to prevent forward movement of the flame tube. This Service Bulletin is not mandatory, but Rolls Royce recommends the modification be carried out when the engine is disassembled sufficiently to afford access to the affected part. The modification had not been carried out.

The suspension pins and liners are subject to special inspection in accordance with Rolls Royce Service Bulletin DA72-485. The time between inspections established in accordance with this bulletin for Eastern Provincial Airways was 1,200 hours. This failure occurred at 1075:43 hours since installation.

ANALYSIS:

The suspension pins and liners of the flame tube in the number five combustion chamber assembly were excessively worn. This allowed the flame tube to move forward and contact the fuel burner pipe. Fretting occurred, and the fuel burner pipe wore through making a hole, which allowed unatomized fuel to be released under pressure into the expansion chamber. This caused excessive heat and pressure and resulted in the combustion chamber erupting. The resultant "blow torch" effect burned the outer shell of the adjacent fuel heater and a hole through the engine cowling.

The fire extinguisher was activated and this, coupled with shutting off the fuel supply, extinguished the fire.

The following laboratory report was completed:
LP 16/68 - Combustion Chamber Assembly.

FINDINGS:

Cause Related:
1. The flame tube locating pins and liners in the number five combustion chamber were excessively worn, allowing the flame tube to move forward.

2. The flame tube contacted the burner pipe in the expansion chamber and wore a hole through it, allowing unatomized fuel to be released into the expansion chamber

3. The flame in this area caused overheating and excessive pressure which resulted in the flame tube and outer casing erupting.

4. The modifications recommended in Rolls Royce Service Bulletin DA72-423 were not carried out.

Other:
1. The inspection interval for flame tube suspension inspection established in accordance with Rolls Royce Service Bulletin DA72-485 for Eastern Provincial Airways was 1,200 hours. Time since last inspection of the number five combustion chamber assembly was 1075.43 hours. Flame tube and suspension pins were replaced at that time.

SAFETY ACTION:

Action Taken:
Compliance with Rolls Royce Service Bulletin No. 72-423 (Mod 1736) became mandatory effective 18 June 1986 with embodiment to be completed by 30 June 1987.

* * * * *

CANADIAN PACIFIC AIRLINES
BOEING 737 C-GCPS
LUMSDEN, SASKATCHEWAN
10 JULY 1986

BRIEF NUMBER: 86-P64052 (Incident)
LOCAL TIME: 1700 CST
OPERATION: Scheduled Domestic
DAMAGE: None
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	N/A	N/A
LAST 90 DAYS	N/A	N/A

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	6
PASSENGERS	-	-	55

REPORTED CIRCUMSTANCES:

A passenger on a scheduled domestic flight was smoking in the aft left washroom. The smoke alarm sounded, and he threw the burning cigarette into the trash can, igniting some paper. The fire was quickly extinguished by a flight attendant.

* * * * *

RAECOM AIR
CESSNA A185F SKYWAGON C-GWXI
ARMI LAKE, NORTHWEST TERRITORIES
12 JANUARY 1986

BRIEF NUMBER: 86-W60002 (Accident)
LOCAL TIME: 1330 MST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,000	2,000
LAST 90 DAYS	150	100

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

REPORTED CIRCUMSTANCES:

The pilot was landing on a snow-covered lake in near whiteout conditions. After a slow circuit, he selected a landing area. During a shallow left turn in preparation for touchdown, a loud bang was heard, the aircraft shook, and the pilot immediately applied full power and climbed away. On a fly past, he saw the entire left gear leg and wheel/ski assembly lying on the ice. He proceeded to home base and landed with mimimal further damage to the aircraft.

The pilot lost vertical reference, and the aircraft struck the ice while in the shallow left turn.

* * * * *

ST. AIR LTD.
CESSNA A185E C-FAQL
LITTLE GRAND RAPIDS, MANITOBA
13 JANUARY 1986

BRIEF NUMBER 86-C60001 (Accident)
LOCAL TIME: 0953 CST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,200	300
LAST 90 DAYS	200	100

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

REPORTED CIRCUMSTANCES:

The pilot of the wheel/ski-equipped aircraft was landing his aircraft on rough, hard-packed snow that covered the ice on a lake. Shortly after touch down, the right gear leg failed. The stub of the gear leg dug into the snow, and the aircraft ground looped.

A pre-crack condition had existed in the failed gear leg. The gear leg had not been inspected prior to the installation of the skis.

* * * * *

WOLLASTON LAKE AIR SERVICE
CESSNA A185F C-GZTU
CLOSE LAKE, SASKATCHEWAN 10 mi N
23 JANUARY 1986

BRIEF NUMBER: 86-C60004 (Accident)
LOCAL TIME: 1045 CDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	7,000	500
LAST 90 DAYS	50	20

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

REPORTED CIRCUMSTANCES:

The pilot was landing the ski-equipped aircraft on the unprepared, snow-covered lake surface. There was a 30- to-40 degree cross-wind from the left at 20 to 25 knots. After touchdown and a landing run of about 100 feet, the left wing lifted, and the right ski dug into the snow. The aircraft slewed to the right, the right wing tip contacted the snow, and the aircraft nosed over.

The pilot reported that at the actual site of the accident, high ground had produced changes in wind direction, and the cross-wind was 70-80 degrees to his flight path.

* * * * *

ARCOT AVIATION LTD.
PIPER PA31-350 C-GRJK
NORMAN WELLS, NORTHWEST TERRITORIES
35 mi SE
13 FEBRUARY 1986

REPORT NUMBER: 86-W60005 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1600 MST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,300	100
LAST 90 DAYS	90	80

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	7

HISTORY OF THE FLIGHT:

The aircraft had been chartered to carry out a crew change at a drilling site near Norman Wells, Northwest Territories. After refuelling at Norman Wells, the pilot proceeded to the rig on a day visual flight rules (VFR) flight. There was a 1,000-foot cloud base, and the visibility was five miles. The ceiling lowered to 800 feet and the visibility to two miles as the aircraft approached the lake on which the ice strip near the rig was located.

The pilot commenced his approach from the south but overshot the approach course on the first approach and initiated a go-around. On the next approach, the aircraft was lined up on final and crossed the tree line at the edge of the lake, descending toward the threshold of the runway. The aircraft touched down 300 feet short of the runway in deep snow.

All occupants escaped without injury but the nose section of the aircraft was substantially damaged.

PERTINENT INFORMATION:

The lake on which the strip was located was approximately one mile in length. The runway extended southward 3,600 feet along the lake from the north shore. An aircraft approaching from the south would have to cross 1,500 feet of unmarked snow from the edge of the lake before reaching the runway.

The pilot, on a previous occasion, had made one flight into the ice strip and had experienced no difficulty landing.

No altimeter setting was available at the lake, nor was the exact altitude of the lake above sea level known to the pilot.

ANALYSIS:

Flying over the trees during the visual circuit aided depth perception; however, there were no visual cues from the shoreline to the runway threshold because of the expanse of unmarked snow. The pilot was unaware that the aircraft was descending below the intended approach path until impact with the snow, some 300 feet short of the runway.

Lead-in boards or spruce trees on the wide expanse of snow between the shoreline and the runway would have provided some visual cues to aid depth perception.

FINDINGS:

Cause Related:

1. No ground visual aids were positioned on the runway approach area to improve depth perception.

2. The pilot approached for landing without visual cues and landed 300 feet short of the runway.

Other:
-Nil-

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NORTHWINDS INC.
PIPER PA-31-310 NAVAJO C-GCJN
LAC BROCHET AIRPORT, MANITOBA
28 APRIL 1986

BRIEF NUMBER: 86-C60032 (Accident)
LOCAL TIME: 1105 CDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Senior Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,500	300
LAST 90 DAYS	120	75

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

REPORTED CIRCUMSTANCES:

Twenty miles from Lac Brochet Airport, the pilot contacted the UNICOM operator and obtained an airport advisory. Part of this advisory contained a caution on landing due to ruts in the sand and gravel runway. The pilot overflew the airport and conducted a visual inspection of the 3,600-foot strip. He noted that the last 800 feet of runway 02 appeared wet. The aircraft touched down about 200 feet beyond the threshold, rolled approximately 900 feet, then veered left. The left main wheel entered soft, sandy ground. The nosewheel then entered the soft sand, and after the aircraft had travelled about 50 feet, the nose landing gear failed.

Although a runway inspection that morning did not reveal any soft spots, close inspection after the accident revealed an 800 foot stretch of dry soft sand near the runway centre line.

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SOUTH WEST AIR LTD.
PIPER PA-31 NAVAJO C-GSWC
WINDSOR AIRPORT, ONTARIO
12 MAY 1986

REPORT NUMBER: 86-O60032 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0920 EDT
OPERATION: Scheduled Domestic
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,187	804
LAST 90 DAYS	176	176

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	2

HISTORY OF THE FLIGHT:

Following take-off from the St. Catharines Airport, the crew reported that the landing gear in-transit light remained illuminated. A short time later, the gear was selected down in order to recycle it; however, the crew did not receive a down-and-locked indication. The emergency gear extension procedure was carried out using the hand pump, but to no avail.

The captain decided to continue on to Windsor Airport where the aircraft was based and where he considered superior emergency equipment was available. On approach to Windsor, another company aircraft, which had been alerted to the problem, flew formation on GSWC and informed the crew that the main landing gear appeared to be extended but that the nose gear was extended to about 45 degrees. The crew carried out a series of manoeuvres in an attempt to move the nose gear into the down position. These manoeuvres, which included an approach to the stall, steep turns, pull-ups and side-slips, proved unsuccessful.

The two passengers on board were moved to the rear of the cabin where they were briefed by the first officer on the landing gear situation and what to expect on landing.

Two touch-and-go landings were carried out in an attempt to 'bump' the nose gear into the extended position, but without success.

The crew received clearance to land on runway 07, which is 7,900 feet long, and were advised that emergency equipment was standing by.

The aircraft touched on the main landing gear, with the pilot holding the nosewheel off the runway as long as possible. The aircraft rolled down the runway, the nose gear retracted into the wheel well towards the end of the roll, and the aircraft slid on its nose structure for about 100 feet before coming to rest nose down on the runway. The crew and passengers evacuated the aircraft without difficulty.

PERTINENT INFORMATION:

The flexible hydraulic line supplying fluid to the open side of the right landing gear door actuator had burst. When the selector valve is moved to the UP (or DOWN as the case may be) position, it electrically actuates the door solenoid valve to the open position, allowing fluid to flow through the door solenoid and thus opening the doors. During the time the doors open, the gear priority valve remains closed as less pressure is required to operate the doors. After the gear doors have opened, pressure continues to build up enough to allow the priority valve to open and permit fluid to flow through the gear selector valve to the gear actuating cylinders, thus allowing the gear to move to the up or down position.

If the door hose bursts, fluid escaping through the damaged hose will not allow pressure to build up in order to open the priority valve to operate the gear actuator, and the sequence cannot be completed. Fluid will continue to leak out until the system is exhausted. The failed hose appeared to have been in use since the aircraft was manufactured in 1972. Since that time, the aircraft had been operated a total of 4,476 hours. The aircraft had been repainted at some time since manufacture. Paint overspray covered all the hoses in the landing gear wheel well area.

This aircraft type is not equipped with a separate system for emergency extension of the landing gear. The gear can be extended using the hand operated hydraulic pump located in the cockpit. However, since the hand pump delivers pressure through the same line system, the fluid from the hand pump section of the reservoir will be lost in the same manner.

The manoeuvres carried out by the pilot were a last recourse to obtain the gear extension to the down-and-locked position; it was not an established emergency procedure. The drag forces opposed the extension of the nose gear. The main gear extends laterally and does not have these same forces applied to it and can be moved into the locked position by the force of gravity applied to it during a pull-up manoeuvre or turn.

ANALYSIS:

Because of excessive wear and age, the flexible hydraulic line failed. As a result, hydraulic fluid escaped until the system was exhausted, and the nose gear could not be extended.

Manoeuvres carried out by the pilot succeeded in locking down the main gear, but the nose gear failed to extend into the locked position because of the drag forces imposed on it during flight.

Since the emergency extension system uses the same hydraulic lines, fluid from the hand pump was lost in the same manner.

The following laboratory report was completed:
LP 111/86 - Hose Failure.

FINDINGS:

Cause Related:
1. Because of excessive wear and age, the hydraulic hose failed, resulting in the loss of all hydraulic fluid and the non-extension of the nose gear.

2. Fluid from the emergency hand pump was lost through the leak because the emergency extension system uses the same hydraulic lines as the normal system.

Other:
-Nil-

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TRANSPORT AIR
CESSNA 172N C-GDJO
ST. QUENTIN, NEW BRUNSWICK
28 JUNE 1986

REPORT NUMBER: 86-A60021 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2215 ADT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	775	250
LAST 90 DAYS	150	140

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

HISTORY OF THE FLIGHT:

The aircraft was chartered by the passenger to fly him from Quebec City, Quebec to St. Quentin, New Brunswick. The aircraft arrived overhead St. Quentin at 2210 Atlantic daylight time (ADT). The pilot made an approach for landing on runway 29 but had to overshoot because he was not sure if the aircraft was lined up with the unlit runway or with a road that ran parallel to it. On the next approach at 2215 ADT the aircraft touched down 1,900 feet down the 2,400-foot runway. The aircraft overran the end of the runway and nosed over.

PERTINENT INFORMATION:

The weather at the time was 4,500 feet scattered cloud with the visibility 15 miles. Official darkness time for the area was 2159 ADT. Witnesses indicated that it was a dark night.

The brother of the passenger was at the airport awaiting the arrival of the aircraft. He drove his car onto the taxiway and parked with the headlights shining across the runway. The taxiway is 1,900 feet from the threshold of runway 29.

The pilot landed the aircraft 16 minutes after official darkness on a runway with which he was unfamiliar. He thought that the car headlights were indicating the threshold of the runway.

Air Regulations, Part VIII, Division 1, Miscellaneous Provisions, para. 804, state that "no person shall take off or land at an aerodrome at night with an aircraft unless the aerodrome is lighted as prescribed pursuant to section 311."

ANALYSIS:

The pilot attempted a landing on the unlit runway after dark in unsuitable light conditions. Because the pilot thought that the car headlights indicated the threshold of the runway, he landed the aircraft long. There was insufficient distance left in which to stop, and the aircraft overran the end of the runway.

FINDINGS:

Cause Related:
1. The pilot landed the aircraft 16 minutes after official darkness on an unlit runway.

2. The pilot landed the aircraft long because he could not discern the runway in the darkness.

3. The car headlights gave the pilot a false indication of the runway threshold.

Other:
- Nil -

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LATHAM ISLAND AIRWAYS LTD.
CESSNA C185 SKYWAGON C-GZEV
BLUENOSE LAKE, NORTHWEST TERRITORIES
31 JULY 1986

BRIEF NUMBER: 86-W60041 (Accident)
LOCAL TIME: 1800 MDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4,100	800
LAST 90 DAYS	250	120

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

REPORTED CIRCUMSTANCES:

The float-equipped aircraft was being flown in support of a geological survey team. Two members had been picked up, and the pilot was making his second crosswind take-off attempt; the wind was from the left at 10 to 15 knots. The aircraft weathercocked left and developed an uncontrollable yaw. A float dug in, and the aircraft came to rest on its back.

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REGINA FLYING CLUB
PIPER PA-38-112 C-GAKT
FORT QU'APPELLE, SASKATCHEWAN
16 JULY 1985

REPORT NUMBER: 85-C50057
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2130 CDT
OPERATION: Flying Club Training
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	50	50
LAST 90 DAYS	50	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The student pilot was authorized to carry out a solo flight in the flying club's approved practice area. The student elected instead to land on a 2,000-foot-long grass strip at Fort Qu'Appelle. He then carried out a sightseeing flight, after which he landed again at Fort Qu'Appelle. During the second departure from Fort Qu'Appelle, the pilot used a short field take-off technique. As the aircraft became airborne, the right wing dropped, and the aircraft drifted to the right and struck a fence which bordered the strip. The aircraft then veered to the left, struck the ground, and the nosewheel collapsed.

The instructor pilot reported that he had to demonstrate the correct short field take-off technique on several occasions and that the student pilot had difficulty applying the technique correctly.

The student pilot stated that, on take-off, he rotated the aircraft at 50 knots, an airspeed which is approximately 10 knots lower than normal rotation speed. Tail skid ground scars found in the take-off area indicate that the aircraft was overrotated on take-off.

According to the evidence, directional control was lost because the aircraft was overrotated and became airborne at a lower than normal airspeed.

FINDINGS:

Cause Related:
1. Directional control was lost when the aircraft was overrotated on take-off and became airborne at a lower than normal airspeed.

Other:
1. The flight was not carried out in accordance with the instructor's authorization.

* * * * *

PIPER PA-28-140 C-GQMV
OSHAWA, ONTARIO
12 SEPTEMBER 1985

REPORT NUMBER: 85-O50073 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2149 EDT
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	450	15
LAST 90 DAYS	300	15

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The aircraft was on final approach after returning from a cross-country night flight from Syracuse, New York to Oshawa, Ontario. Approximately one mile from the threshold, the pilot reported that he was experiencing engine problems, and, shortly thereafter, the engine stopped. The pilot decided to carry out a forced landing in a corn field short of the runway. The aircraft struck the ground in a nose-down attitude.

Prior to departing Syracuse, the pilot visually checked the fuel and determined that there was sufficient fuel in the tanks to complete the flight. The investigation determined that the engine stoppage was due to fuel starvation. The right fuel tank, which the pilot had selected for landing, had run dry. The pilot reported that the tank had been indicating over half-full when selected 10 to 15 minutes prior to landing. There was no evidence of fuel venting or leaking from the right tank. The left tank contained fuel, but the quantity could not be determined because the tank leaked after the impact.

Post-accident calibration of the right fuel gauge showed that the gauge could indicate a quantity of nine gallons when in fact only two gallons remained. Piper had issued a Service Bulletin, Number 533, that dealt with fuel gauge calibration inspections, and although the bulletin did not pertain to this aircraft, the inaccuracies found in the fuel gauge were consistent with those indicated in the bulletin.

After the engine stopped, the pilot had no choice but to land short of the runway. The aircraft landing light was on but did not illuminate the landing area very well. The pilot had difficulty judging his height above ground because of the darkness and the height of the corn; the aircraft stalled just prior to touchdown and struck the ground in a 20-degree, nose-down attitude.

The aircraft was involved in an incident about three months prior to the accident, in which the engine stopped due to fuel starvation. Although evidence gathered at that time was not conclusive, it appeared that the pilot was relying on the fuel gauges and allowed the right tank to run dry. The aircraft was force-landed in a field without any damage; the fuel selector was selected to the left tank, and the aircraft was flown back to the airport without further incident.

The emergency locator transmitter (ELT) was activated by the 'G' forces on impact with the ground; however, the signal was not received at the control tower, one mile away. The ELT antenna had broken off at some time prior to the accident.

FINDINGS:

Cause Related:
1. The engine stopped on final approach because of fuel starvation.

2. The right fuel tank contained no usable fuel.

3. The right fuel gauge was inaccurate; there was less fuel in the tank than the gauge indicated.

4. The aircraft stalled prior to touchdown.

Other:
1. The ELT was ineffective because the antenna had been broken off at some time prior to the accident.

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HIGHWOOD AIR SERVICES (1984) INC.
CESSNA 152 C-GGEQ
OKOTOKS AIR PARK, ALBERTA
12 NOVEMBER 1985

REPORT NUMBER: 85-W50062 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1500 MST
OPERATION: Specialty Flying Training
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	41	36
LAST 90 DAYS	16	15

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The student was on a local solo training flight. During the landing roll, the aircraft slowly veered to the right. The student applied some left rudder and light brake pressure; however, directional control was not maintained, and the right main landing gear struck a snowbank on the edge of the runway. The aircraft swung further to the right; the nose gear struck the snowbank, and the aircraft nosed over.

The runway at the time of the occurrence was covered with patches of snow. Although the student had applied opposite rudder, this was ineffective, and the aircraft continued to swerve. The student only applied light brake pressure because he believed that the aircraft would skid on the patchy surface. A heavier application of brake and use of full rudder might have permitted the student to regain and maintain directional control of the aircraft.

FINDINGS:

Cause Related:
1. The student pilot did not maintain directional control during the landing roll; the aircraft left the runway and struck a snowbank.

Other:
- Nil -

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AERO AVIATION CENTRE (1981) LTD
PIPER PA38 C-GRKJ
CALAHOO, ALBERTA 5 mi W
15 NOVEMBER 1985

REPORT NUMBER: 85-W50064 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1540 MST
OPERATION: Specialty Flying Training
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,200	380
LAST 90 DAYS	100	100

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was returning to base at the end of a dual training flight. The instructor took over the controls and advised the student that he was going to demonstrate a forced landing from a low level. As the aircraft was flying low over trees and approaching a clearing straight ahead, the instructor reduced power to descend into the clearing. While the aircraft was descending over the edge of the clearing, it struck a set of power lines which crossed the flight path at a height of about 30 feet above the ground. The aircraft pitched down and struck the ground nose first, before coming to rest in an inverted position. The student pilot was seriously injured.

The power lines are about 45 feet from the tree line and parallel to it. The tree-tops are approximately the same height as the power lines. The instructor was not familiar with the field that he had selected for the demonstration.

The investigation established that during the low straight-in approach over the trees, the power lines would not be readily visible to the instructor. The instructor was unaware that there were power lines at that location; however, an aerial inspection of the area had not been performed prior to the demonstration.

FINDINGS:

Cause Related:
1. While the aircraft was flying at a low height above trees, the instructor attempted to demonstrate a forced landing straight-in approach into a clearing with which he was not familiar.

2. On very short final, the aircraft struck power lines which crossed the flight path.

3. The power lines could not be seen readily from the approach; the area had not been previously inspected.

Other:
-Nil-

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INTERLAKE AVIATION
CESSNA 150K CF-TFF
GIMLI INDUSTRIAL PARK, MANITOBA
07 DECEMBER 1985

REPORT NUMBER: 85-C50095 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1510 CST
OPERATION: Flying Club Training
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	40	40
LAST 90 DAYS	22	22

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The student pilot who was on an authorized solo training flight, was practising short- and soft-field landings at his training base. He had completed several approaches and landings and was on final approach for a full-stop landing, when the main wheels of the aircraft struck deep snow short of the runway, and the aircraft nosed over.

The pilot misjudged his height during the final approach and was too low on final. The pilot stated that he had not been in a similar situation before and was reluctant to add power too quickly for fear the engine, because of the cold air temperature, might not accelerate smoothly. Although he increased engine power, he did not do so in time to prevent the aircraft from settling into the deep snow.

FINDINGS:

Cause Related:
1. The pilot misjudged his height on approach and was too low on final.

2. Due to the pilot's inexperience, he did not increase the engine power in time to prevent the aircraft from settling into deep snow, and, as a result, the aircraft nosed over.

Other:
-Nil-

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DRYDEN FLIGHT CENTRE LTD.
CESSNA 150J C-GRED
DRYDEN, ONTARIO 10 mi SW
13 FEBRUARY 1986

BRIEF NUMBER: 86-C60007 (Accident)
LOCAL TIME: 1630 CST
OPERATION: Flying Club Training
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	INSTRUCTOR		STUDENT	
	ALL TYPES	ON TYPE	ALL TYPES	ON TYPE
TOTAL	850	350	24	N/A
LAST 90 DAYS	25	25	20	N/A

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

The instructor asked the student to initiate a practice forced approach directly over a ski strip. The temperature was minus 13 degrees Celsius, and 1200 rpm and 10 degrees of flap were used to simulate a power-off glide. Carburettor heat was on throughout the approach. When the student completed the turn onto final, at about 100 feet above ground level, the instructor called for the overshoot. The student selected carburettor heat off, then pushed the throttle fully open. The engine sputtered and stopped, and power could not be restored in the remaining altitude. The aircraft was landed on the ski strip, and it nosed over in deep snow.

The operating handbook specified that the throttle was to be fully opened before carburetter heat was selected "off".

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KINNIBURGH SPRAY SERVICES LTD.
GRUMMAN G164A C-FHFE
COALDATE, ALBERTA 7 mi N
06 JULY 1985

REPORT NUMBER: 85-W50032 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0715MDT
OPERATION: Specialty Aerial Application and Distribution
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS	ALL TYPES	ON TYPE
TOTAL	5,000	4,000
LAST 90 DAYS	150	150

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

HISTORY OF THE FLIGHT:

The pilot took off from the Lethbridge Airport on a local crop spraying operation. The aircraft was at about 300 feet above ground level (agl) and crossing a three-mile-wide river valley, when the pilot heard a grinding sound from the engine (Pratt and Whitney R1340-AN-1), accompanied by a loss of power. Unable to maintain altitude, the pilot jettisoned the load and carried out a forced landing into the river. The aircraft came to rest in an inverted position in about four feet of water. The pilot, who was upside down and submerged, experienced some difficulty exiting the aircraft but did escape with minor injuries.

PERTINENT INFORMATION:

The engine was recovered and transported to an overhaul facility for examination. Disassembly revealed that the supercharger impeller shaft bearings had failed. Associated drive gears had many broken teeth, and the impeller housing was scored. The remaining supercharger bearings were galled and showed evidence of overheating. No other fault was found with the engine.

Research into this failure revealed that Pratt and Whitney had issued Service Bulletin 1658 on 21 April 1972. This bulletin detailed a modification to the lubrication system of the supercharger. The modification was not incorporated into the engine; compliance was optional.

ANALYSIS:

Examination of the engine disclosed that the supercharger drive shaft bearings had failed, thus allowing the supercharger impeller to rub on the housing. When the bearings failed, several of the balls jammed the drive gears and several gears were stripped due to lack of lubrication.

The manufacturer was aware that the supercharger drive shaft bearings were not receiving adequate lubrication during start-up and had issued the Service Bulletin which provided information concerning the modification of the supercharger's lubrication system. Compliance with the modification ensures adequate lubrication on start-up.

FINDINGS:

Cause Related:
1. The design of the supercharger's lubrication system did not allow for adequate lubrication on start-up.

2. Although the manufacturer had issued a Service Bulletin detailing a modification to the supercharger's lubrication system, compliance was not mandatory.

3. The modification specified in the Service Bulletin was not incorporated during the last engine overhaul.

4. The engine lost power when the supercharger impeller shaft bearings failed because of a lack of lubrication.

Other:
-Nil-

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GENERAL AIR CARE LTD
PIPER PA-25-235 C-GNIP
SOURIS, MANITOBA
07 JULY 1985

REPORT NUMBER: 85-C50053 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 2200 CDT
OPERATION: Specialty Aerial Application and Distribution
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	11,000	630
LAST 90 DAYS	120	100

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot of the agricultural aircraft was departing from a dirt road to conduct an aerial spray operation. During take-off, the spray boom below the trailing edge of the aircraft's right wing caught in the tall grass along the edge of the road. The aircraft swung to the right, and the pilot was unable to correct before the aircraft ran off the right side of the road and entered a ditch. The left main landing gear collapsed, causing the left wing to buckle.

The road used for the take-off was about 20 feet wide and the grass was about three feet tall. The aircraft's wing span was 36 feet, and the ground clearance to the spray boom was less than three feet.

The right wing overhung the grass along the edge of the road, and, because of the lack of clearance, the spray boom was dragged in the grass, causing the pilot to lose directional control. The road was unsuitable for the operation.

FINDINGS:

Cause Related:
1. The pilot lost directional control of the aircraft when the spray boom caught in the grass along the edge of the road.

2. The road used for the take-off was unsuitable.

3. The aircraft was damaged when it ran off the road and into a ditch.

Other:
-Nil-

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TAKU AIR TRANSPORT LTD.
DE HAVILLAND DHC-2 BEAVER C-GAEE
ATLIN LAKE, BRITISH COLUMBIA
08 JULY 1985

REPORT NUMBER: 85-P50025 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2030 PDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	750	200
LAST 90 DAYS	175	125

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

Two four-by-eight-foot sheets of plywood were attached in a nearly vertical position to the outside of the aircraft, with the plywood resting on the right float. During the take-off run, the aircraft veered to the left toward a moored houseboat. The pilot rejected the take-off; however, she was unable to prevent a collision with the houseboat.

The prevailing wind was from the left of the take-off direction at about 10 knots. The initial portion of the take-off run was made in the lee of an island.

The plywood imposed an unexpected left turning force on the aircraft which the pilot was unable to counteract with normal control inputs. The cross-wind from the left increased the amount of control required. The pilot waited until the aircraft was planing on the water before rejecting the take-off, because she thought that the increased forward velocity would increase aircraft control enough that the swing could be stopped. When the pilot rejected the take-off, there was insufficient space remaining to stop the aircraft.

FINDINGS:

Cause Related:
1. The pilot was unable to maintain directional control on take-off because of the aerodynamic effects produced by the externally loaded sheets of plywood.

2. The pilot delayed rejecting the take-off and, as a result, could not stop the aircraft before it collided with a moored houseboat.

Other:
- Nil -

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PRECISION HOLDINGS LTD.
PIPER PA-31 C-GKOJ
WILLIAMS LAKE, BRITISH COLUMBIA 14 mi N
17 JULY 1985

REPORT NUMBER: 85-P50027 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0850 PDT
OPERATION: Charter
DAMAGE: Destroyed
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,800	1,500
LAST 90 DAYS	110	110

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft crashed ten minutes after taking off from Williams Lake Airport. On impact, the aircraft was in a slightly nose-down, 58-degree left bank attitude. The pilot's body was not found.

An analysis of the flight path and wreckage revealed that the autopilot was engaged, the pilot's seat-belt was undone, and both halves of the clam-shell cabin door were open prior to impact. There was no evidence that the pilot was on board at impact, nor was there any apparent reason for the pilot voluntarily exiting the aircraft in flight.

An Airworthiness Directive (AD), 78-05-05, which requires installation of an additional sliding bolt type latch for the upper half of the door, had been complied with. However, the investigation found that some pilots feel greater than normal care and attention are required to ensure that the clam-shell door on this aircraft type is securely closed.

Damage to the clam-shell door indicates that the upper half came open in flight. To resecure the upper half, the lower half would have had to have been opened then closed again after the upper half had been secured. It is possible that the pilot engaged the autopilot, then attempted to close the doors in flight, but was flung out of the aircraft when he opened the lower half of the door.

FINDINGS:

Cause Related:
1. The upper half of the clam-shell door came open in flight for undetermined reasons.

2. The pilot disappeared from the aircraft in flight for undetermined reasons.

Other:
1. It is possible for the door on this aircraft type to come open in flight if not properly secured.

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CESSNA C172N C-GKNJ
GOLDEN, BRITISH COLUMBIA
18 JULY 1985

REPORT NUMBER: 85-P50029 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1810 PDT
OPERATION: Private Recreational
DAMAGE: Destroyed
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	88	88
LAST 90 DAYS	27	27

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	-	2	1

HISTORY OF THE FLIGHT:

The aircraft departed Golden Municipal Airport at 1810 Pacific daylight time (PDT) with the pilot and three passengers on board. A recreational flight south of the airport was planned. The aircraft climbed to altitude above Golden then continued climbing up Canyon Creek. While following the rising terrain towards the end of Canyon Creek, at an altitude of 6,600 feet above sea level, the aircraft crashed into high trees. The pilot was killed, and two passengers were seriously injured.

PERTINENT INFORMATION:

At the time of the accident, the skies were clear, the visibility was unlimited, the winds were light and variable, and the temperature was about 20 degrees Celsius.

The aircraft was in a steep, nose-down inverted attitude on initial impact, and propeller strike marks on the trees indicated substantial engine power at the time of tree impact. There were no apparent pre-impact aircraft failures or malfunctions.

At the time of the accident, the aircraft was at or slightly under the maximum take-off weight of 2,300 pounds. The aircraft flight manual indicates that at this weight and at 6,500 feet above sea level, using the best climb speed of 72 mph, the maximum vertical speed would be 344 feet per minute. This aircraft performance would result in a climb gradient of about three degrees. The slope of the terrain at Canyon Creek increased quite rapidly from 2.8 degrees to 4.4 degrees at the accident scene.

ANALYSIS:

The aircraft was stalled when it first struck the trees. The stall occurred because the pilot allowed the airspeed to decrease while he was attempting to fly up a slope that was steeper than the aircraft was able to negotiate.

FINDINGS:

Cause Related:
1. The pilot misjudged aircraft climb performance relative to rising terrain in his flight path, and the aircraft stalled.

Other:
-Nil-

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FORRESTER CROP SPRAYING LTD
CESSNA A188B AGWAGON C-GYYA
BROMHEAD, SASKATCHEWAN 1 mi NW
19 JULY 1985

REPORT NUMBER: 85-C50063 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1000 CST
OPERATION: Specialty Aerial Application and Distribution
DAMAGE: Destroyed
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,000	1,000
LAST 90 DAYS	200	200

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was conducting an aerial spray operation and had completed several spray runs. The aircraft was proceeding from west to east on a swath run when the vertical fin struck a power line. The aircraft struck the ground immediately following the wire strike and was destroyed.

The pilot had flown spray aircraft for approximately 100 hours in the last 30 days, 15 hours of which were flown in the last 3 days. The pilot stated that he was fatigued. During each west to east spray run, the pilot flew the aircraft under the power line.

Although the pilot had flown under the power line several times and was fully aware of this hazard, he failed to adjust his altitude, and the aircraft struck the wire.

FINDINGS:

Cause Related:
1. The pilot was fatigued and misjudged the clearance between the aircraft and the power line.

2. The aircraft struck the power line.

Other:
-Nil-

SAFETY ACTION:

Action Taken:
In 1986, the Canadian Aviation Safety Board completed a study on pilot fatigue and issued six recommendations to the Minister of Transport.

Recommendation CASB 86-14 specifically addressed fatigue encountered by aircrew while conducting specialty operations such as crop spraying. Consequently, Transport Canada has initiated further studies which will examine the requirement for and the feasibility of introducing legislation governing crew duty time for pilots flying in specialty operations.

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MITCHINSON FLYING SERVICE
CESSNA 152 C-GZBA
GLENSIDE, SASKATCHEWAN 4 mi SE
21 JULY 1985

REPORT NUMBER: 85-C50061 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1620 CST
OPERATION: Specialty Recreational Flying
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	77	61
LAST 90 DAYS	6	4

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

Thirty minutes after take-off, the aircraft suffered a partial loss of engine power and would not maintain altitude. A forced landing was carried out on a grid road; however, the pilot was unable to maintain directional control. The aircraft veered into a field and came to rest in an inverted position.

The pilot reported that, according to his fuel calculations, there should have been 1 hour and 25 minutes of fuel on board for the planned 55-minute flight. There is a requirement for a 45-minute fuel reserve when flying VFR. The pilot dipped the fuel tanks just prior to start-up and determined that there were eight gallons of fuel in the tanks. On this aircraft, three gallons of fuel are unusable. The manufacturer's performance charts indicate that fuel consumption at cruise power is in excess of five gallons per hour. Therefore, the loss of engine power was caused by fuel exhaustion.

The pilot reported that, just as he was touching down, a gust of wind caught the aircraft. As a result, the left main gear went off the edge of the road, and the pilot was unable to maintain directional control of the aircraft.

FINDINGS:

Cause Related:
1. The pilot did not calculate his fuel requirement correctly.

2. The engine power loss was caused by fuel exhaustion.

3. The pilot was unable to maintain directional control of the aircraft during the forced landing.

Other:
1. The pilot did not have the 45-minute fuel reserve as required by regulations when flying a visual flight rules trip.

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PERIMETER AVIATION
BEECH 95-B55 BARON C-GCIO
THE PAS, MANITOBA
23 JULY 1985

REPORT NUMBER: 85-C50064 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1657 CDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,000	1,300
LAST 90 DAYS	300	260

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was conducting a courier flight from Flin Flon, Manitoba to The Pas, Manitoba. On arrival at The Pas, the pilot flew an approach to runway 30. He selected full flap and the landing gear lever down. The aircraft was landed with the landing gear retracted.

An examination of the landing gear system revealed that the gear motor brushes were not making contact with the armature, thereby rendering the motor inoperative. The pilot stated that he had not checked the landing gear position indicator lights after selecting the gear lever down and that he had not used a pre-landing check-list.

FINDINGS:

Cause Related:
1. When the pilot selected the gear lever down, the landing gear failed to extend because of an inoperative gear motor.

2. The pilot did not employ a pre-landing check-list and did not notice that the landing gear had remained in the retracted position.

Other:
- Nil -

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AVIAIR AVIATION (1984) LTD.
CESSNA 210L C-GICH
KAMLOOPS AIRPORT, BRITISH COLUMBIA
28 JULY 1985

REPORT NUMBER: 85-P54018 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1340 PDT
OPERATION: Specialty Charter
DAMAGE: Minor
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4,800	3,400
LAST 90 DAYS	250	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

HISTORY OF THE FLIGHT:

The aircraft was on a specialty charter flight in support of fire control. It had just lifted off and was climbing through 200 feet above ground with the gear retracted, when a severe vibration and a significant power loss occurred. The take-off was rejected, and a gear-up landing was made onto the runway.

PERTINENT INFORMATION:

On-site investigation revealed that an internal failure of one of the propeller blades had occurred, thus allowing the blade to move freely within the hub. Examination of the propeller at FC Propulsion in Vancouver, British Columbia, revealed that a blade actuating pin and link had broken.

Examination of the failed parts at the Board's Safety Engineering Branch determined the following:

- The pitch actuating pin had failed in fatigue which had originated at multiple origins in the thread root and had propagated in a high-cycle, low-stress mode under unidirectional bending forces.

- The composite linkage displayed no evidence of progressive failure and appeared to have been subjected to overstress.

The three-bladed McCauley propeller had been overhauled and installed on the aircraft on 12 April 1984. Following tip damage on 24 October 1984, it was repaired, internally inspected, and reinstalled as airworthy. As of 24 July 1985, four days before the accident, the propeller had logged 455.6 hours of its 1,200-hour or five-year service life.

To determine if propeller rpm might have contributed to the occurrence, the propeller governor was functionally tested. The finding of a higher than expected maximum governor setting - 3,115 rpm instead of 2,850 rpm - was forwarded to the Safety Engineering Branch for reference.

During the tear-down examination of the installed engine (Continental IO-520-L), at Progressive Air of Kamloops, British Columbia, it was noted that the mating faces of the rod caps and rods were fretted and that the big bearing bores were out-of-round. To determine if higher than normal propeller rpm might have contributed to these findings, identified parts were shipped to the Safety Engineering Branch for analysis. It was determined that these model connecting rods are used in geared Continental 520 engines rated at 3,400 rpm; hence, the cited rpm of 3,115 should not have caused any material damage to the connecting rods.

ANALYSIS:

The cause of the fatigue failure of the pitch actuating pin was not determined. When the pin failed inside the propeller hub, the affected blade unloaded aerodynamically. As it assumed a pitch angle that was not compatible with the other two blades, the propeller became aerodynamically unbalanced. Motivated by the resulting vibration and attendant power loss, the pilot landed the aircraft straight ahead. As the landing gear had already been retracted, and time did not allow for its extension, the pilot carried out a gear-up landing.

The following laboratory report was completed:
LP 184/85 - Blade Actuating Pin and Link, McCauley Propeller Cessna 210, C-GICH.

FINDINGS:

Cause Related:

1. The actuating pin in one of the propeller blades failed in fatigue which had originated in the thread root. The cause of the fatigue was not determined.

Other:

1. The propeller governor was set for a maximum rpm of 3,115, rather than the specified 2,850.

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LES ARROSAGES AÉRIENS CASTOR INC.
PIPER PA-25-235 PAWNEE C-FYSK
ST-LOUIS-DE-GONZAGUE, QUEBEC
31 JULY 1985

BRIEF NUMBER: 85-Q50048 (Accident)
LOCAL TIME: 0630 EDT
OPERATION: Specialty Aerial Application and Distribution
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	6,700	500
LAST 90 DAYS	200	100

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

The aircraft was departing for the second spray mission of the day, from a 45-foot-wide grassy road bisecting two cornfields. As the aircraft started to roll, with full power applied, it veered left, and the left wing contacted the tall corn stalks. The pilot applied right rudder and brakes, but the stopping action was ineffective. He retarded the throttle to reject the take-off but did not regain directional control, and the right wing tip dug into the soil.

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PRAIRIE AGRI SERVICES
CESSNA A188B C-GIKJ
HUMBOLT, SASKATCHEWAN 15 mi SW
10 AUGUST 1985

REPORT NUMBER: 85-C50068 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1300 CST
OPERATION: Specialty Aerial Application and Distribution
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,900	500
LAST 90 DAYS	250	250

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot made a left teardrop turn at about 60 feet above ground level in order to reposition the aircraft for a spray run. After crossing a power line and a stand of trees, he initiated a descent to the desired spray height, but a higher than normal descent rate developed. The pilot applied full engine power to level the aircraft and started a right turn to avoid some willow trees on the top of a small rise. However, it became apparent that he could not clear the willows, and he was rolling the aircraft level as it struck them. The pilot was unable to keep the aircraft airborne, and it slid for 80 feet through a mature rape crop before coming to rest.

The temperature was 14 degrees Celsius, the reported wind was six knots, and some low level turbulence had developed. The aircraft's weight was about 1,000 pounds below the maximum for take-off, and its centre of gravity was within limits. Four hundred and eighty pounds of chemical remained in the spray hopper and was not jettisoned. The investigation did not find any pre-impact discrepancies with the aircraft. Damage to the leading edge of the wings indicated that the aircraft was in a relatively level attitude when it struck the willows, six feet above ground level. Reportedly, the airspeed was about 100 mph at the start of the teardrop turn.

The pilot had finished spraying the main field and was about to spray a seeded border area of rolling ground, dotted with clumps of bushes and trees; there was a power line bordering the south side of the field. The conditions with low-level air turbulence were not ideal for low-level operations over rolling, obstacle-strewn terrain.

FINDINGS:

Cause Related:
1. The pilot was unable to recover from a descent in sufficient time to avoid trees.

Other:
-Nil-

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FOOTHILLS FLYING SERVICE LTD.
SCHWEIZER GRUMMAN AG-CAT C-GZQN
RABBIT LAKE, SASKATCHEWAN
23 AUGUST 1985

REPORT NUMBER: 85-C50072 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1315 CDT
OPERATION: Specialty Aerial Application and Distribution
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	600	400
LAST 90 DAYS	110	110

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot of the biplane aircraft was carrying out an agricultural spray operation on a field. After completing the second spray run, the aircraft's left wing struck a power line. The wire did not break, and the aircraft yawed to the left, struck the ground and flipped over.

There was no flagman present, and the pilot did not inspect the area for obstructions prior to beginning the spray runs. The power line, which was located at the end of the field, was difficult to see.

The aircraft was equipped with wire cutters on the interplane struts; however, there was a narrow gap between the bottom edge of the top wing and the top of the wire cutter. The wire, when struck, became lodged in this gap and caused the aircraft to yaw to the left. The wire cutters were an approved modification under supplementary type certificate SA1472NM.

FINDINGS:

Cause Related:
1. Because the pilot had not inspected the area, he was unaware of the power line.

2. When the aircraft struck the power line, the wire became lodged in the narrow gap between the upper wing and wire cutter; as a result, the aircraft yawed to the left, struck the ground and flipped over.

Other:
-Nil-

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AGRIC AIR INC
PA-25-235 PAWNEE C-GABS
ATIKOKAN, ONTARIO 20 mi ENE
24 AUGUST 1985

REPORT NUMBER: 85-C50073 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 2000 EST
OPERATION: Specialty Aerial Application and Distribution
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1525	475
LAST 90 DAYS	210	137

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

As the aircraft approached high ground just after take-off on a spraying operation, the aircraft appeared to the pilot to be sinking. He jettisoned 15 to 20 gallons of a total of about 100 gallons of herbicides on board and raised the nose of the aircraft in order to clear the high ground. The aircraft stalled because of low airspeed, and the pilot jettisoned the remainder of the load. During the recovery from the stall, the aircraft struck trees and crashed.

There were no reported aircraft malfunctions. The aircraft was about 100 pounds below maximum take-off weight and was apparently within balance limits. The pilot was operating from a dirt bush road at about 1,500 feet above sea level in hilly terrain. The weather was good, there were no clouds, the visibility was 15 miles, the wind was calm, and the temperature was 14 degrees Celsius.

The reason for the inability of the aircraft to climb was not determined. With calm winds, it is unlikely that a downdraft was encountered, and the density altitude was about 1,500 feet, which would not have greatly affected aircraft performance. The aircraft stalled because the pilot raised the nose to increase the climb angle, which resulted in too low an airspeed to maintain flight. Had all of the herbicide been jettisoned initially, the aircraft may not have stalled; there was probably over 700 pounds of herbicide on board at the time of the stall.

FINDINGS:

Cause Related:

1. During the initial climb, the aircraft started to sink for undetermined reasons.

2. The aircraft stalled and subsequently crashed when the pilot raised the nose to increase the climb angle.

Other:

1. The pilot did not jettison all of the herbicide when the aircraft started to sink.

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CESSNA 206G C-GGSG
NEW WESTMINSTER, BRITISH COLUMBIA
25 AUGUST 1985

REPORT NUMBER: 85-P50043 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1715 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,000	500
LAST 90 DAYS	50	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	1	-	-

HISTORY OF THE FLIGHT:

The pilot and passenger were returning to New Westminster, British Columbia from Horsefly Lake,in the unpressurized aircraft. The return flight had lasted one hour and forty-five minutes of which forty-five minutes had been flown at 10,000 feet above sea level (asl). The passenger in the right front seat had slept for part of the trip. While the aircraft was being landed on the Fraser River at New Westminster, the passenger collapsed over the flight controls. The pilot was unable to maintain control of the aircraft, and it nosed over into the water. The pilot escaped through the window in the left cabin door and then returned and rescued the passenger. The passenger was declared dead on arrival at hospital.

PERTINENT INFORMATION:

The passenger had had a history of heart-related problems and had undergone bypass surgery. In the week prior to the accident, he had spent two days in bed, as he was having difficulty breathing; however, his condition had improved with medication, and he had felt well enough to make the trip.

An autopsy determined that the passenger had died as a result of severe arteriosclerotic coronary artery disease. The passenger collapsed over the flight controls after suffering a heart attack, and he forced the controls forward, causing the aircraft to pitch nose-down into the water and to nose over. The aircraft was equipped with diagonal shoulder harnesses; however, neither the pilot nor the passenger was wearing one.

ANALYSIS:

The investigation did not determine if the passenger's illness the week prior to the accident had any bearing on his subsequent collapse. The one hour and forty-five minute flight, of which forty-five minutes was flown at 10,000 feet asl in an unpressurized aircraft, may have been a contributing factor.

It was determined that, had the passenger been wearing the shoulder harness provided, he would not have collapsed over the flight controls. Instead, he would have been held upright in his seat, and the pilot would have been able to maintain aircraft control while landing.

FINDINGS:

Cause Related:

1. A passenger, who had been experiencing heart-related medical problems, collapsed after suffering a heart attack following a one hour and forty-five minute flight which was partly flown at 10,000 feet asl, in an unpressurized aircraft.

2. The shoulder harness provided was not worn, and, consequently, when the passenger collapsed, he interfered with the flight controls, and the pilot was unable to maintain control during the landing.

Other:
-Nil-

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ALERT AIRWAYS GROUP
CESSNA 172P C-GONM
JANVIER, ALBERTA
04 SEPTEMBER 1985

REPORT NUMBER: 85-W50046 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0800 MDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	702	702
LAST 90 DAYS	371	371

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW:	-	1	-
PASSENGERS:	-	-	-

SUMMARY REPORT:

The pilot was on a visual flight rules (VFR) flight from Fort McMurray to Janvier, Alberta. While en route, he was advised by a pilot flying the same route that the Janvier area was cloud covered. At about 0800 MDT, a witness on the ground heard an aircraft in the vicinity of the airfield and then heard the sound of a crash. The aircraft was located about 500 feet north of runway 13, and the pilot was rescued from the wreckage. The pilot was seriously injured.

At the time of the accident, the sky was obscured in fog, and the wind was calm. A MEDIVAC flight, which had been dispatched to Janvier to evacuate the pilot, could not land until 0930 because of the fog in the immediate vicinity of the airfield. There are no electronic approach aids to Janvier.

While approaching the button of runway 13, the aircraft struck the ground with the left wing first, in a steep nose-down attitude. The shoulder harness was stowed and not in use at the time. As a result of injuries sustained in the accident, the pilot could not recall what had occurred during the latter stages of the flight, except that he may have flown into the fog. During the previous 90 days, the pilot had flown to the Janvier airstrip 95 times and had accumulated 371 flying hours.

The pilot attempted to carry out a VFR approach in conditions of reduced visibility and lost control of the aircraft. The wreckage pattern is consistent with the aircraft's striking the ground in a stalled condition. The seriousness of the injuries to the pilot would have been reduced had he worn his shoulder harness.

FINDINGS:

Cause Related:
1. On approach, in poor visibility conditions, the aircraft stalled and struck the ground.

2. The pilot was not wearing his shoulder harness.

Other:
-Nil-

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AKLAK AIR LTD.
CESSNA 185F C-GZDG
IGLOOLIK, NORTHWEST TERRITORIES
11 SEPTEMBER 1985

REPORT NUMBER: 85-C50077 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 0545 CDT
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	6,000	3,500
LAST 90 DAYS	300	250

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

At dawn, the pilot of the float-equipped aircraft commenced his take-off run toward the south on a small, circular lake. Once on the step, the aircraft was turned eastward to allow for a longer run. Approaching the eastern shore, the pilot turned northward; however, the aircraft skipped sideways and ran up on shore.

The pilot did not report any aircraft malfunction, and the aircraft was reportedly within weight and balance limits. The wind was light from the southwest at the time. The pilot stated that he had taken off from this lake ten times previously.

The land surrounding the lake is flat and featureless, and, in the light of dawn, the pilot was unable to clearly see the shoreline. The aircraft was too near the shore when the turn northward was commenced, either because the pilot did not see the shoreline clearly enough to be able to judge distance accurately, or he misjudged the distance required for the turn. Further, it is evident from the take-off path followed that the lake was too small to be considered a suitable take-off area.

FINDINGS:

Cause Related:

1. The pilot selected an unsuitably small area for take-off.

2. The flat, featureless terrain and the low light made it difficult for the pilot to accurately estimate his distance from the shoreline.

Other:
-Nil-

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RAVENSCROFT AIR SERVICE
CESSNA 185F C-GEFA
TEMAGAMI, ONTARIO
15 SEPTEMBER 1985

REPORT NUMBER: 85-O50075 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1850 EDT
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	450	100
LAST 90 DAYS	80	80

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The float-equipped aircraft was cruising on a non-revenue visual flight rules (VFR) flight at 250 to 300 feet above ground level, when the engine stopped. The pilot lowered the flap and force-landed into dense bush.

The investigation revealed that the left tank contained 20 litres of fuel and the right fuel tank was empty. As well, no fuel was found in the accumulator tank or the gascolator bowl; about four ounces of fuel were drained out of the fuel line from the right tank. There was no evidence of fuel leakage, and subsequent testing of the fuel and vent system did not reveal any leaks. The pilot reported that he had removed the right fuel tank cap after the crash; some fuel drained out of the tank, and he quickly replaced the cap. Because of the aircraft attitude after the crash, it is presumed that any fuel that remained in the right tank drained to the left tank through the interconnecting vapour return line. The amount of unusable fuel in this aircraft is listed as six gallons (US) or about 23 litres.

A substantial amount of water was found in the fuel line at the manifold, and there were eight drops of water in the otherwise empty gascolator. The source of the water was not determined.

The pilot stated that the tanks contained 16 gallons (72 litres) of fuel at the start of the planned 30-minute flight. At an estimated fuel consumption of 16 gallons (72 litres) per hour, and allowing for 23 litres of unusable fuel, there was fuel for about 40 minutes. There was barely enough fuel on board to complete the planned flight and well below that required by regulations, that is, sufficient fuel to fly to destination and thereafter for 45 minutes at normal cruising speed. The pilot had flown about 27 minutes, and he was about eight miles from his destination when the engine stopped.

When the engine stopped, there was no usable fuel in the aircraft, and the fuel lines were contaminated with water. If the engine stopped because of the water, it was only moments before it would have stopped because of fuel exhaustion.

FINDINGS:

Cause Related:

1. The engine stopped because of fuel exhaustion.

2. The fuel in the aircraft fuel system was contaminated with water.

3. The pilot did not ensure that there was sufficient fuel in the aircraft to complete the flight.

4. The pilot had to force-land the aircraft in dense bush.

Other:

1. The aircraft did not have a 45-minute reserve of fuel as required by regulations.

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SOUNDAIR CORPORATION
CESSNA 310R G-GDYI
FORT FRANCES, ONTARIO
20 SEPTEMBER 1985

REPORT NUMBER: 85-C54035 (Incident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1915 CDT
OPERATION: Charter
DAMAGE: Minor
PILOT LICENCE: Airline Transport

PILOT HOURS:	PILOT-IN-COMMAND		CO-PILOT	
	ALL TYPES	ON TYPE	ALL TYPES	ON TYPE
TOTAL	2,650	1,000	2,500	200
LAST 90 DAYS	200	200	200	200

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

The Cessna 310R aircraft was being used to conduct a scheduled courier flight from Atikokan to Fort Frances, Ontario. Immediately after landing on runway 30 at Fort Frances, the aircraft's right main landing gear failed rearwards, allowing the right wing of the aircraft to settle and the right propeller to strike the runway. The crew shut down both engines, retracted the aircraft flaps, and used brakes to keep the aircraft on the runway. The aircraft travelled 1,140 feet from touchdown and stopped at a point 1,200 feet from the button of runway 30, coming to rest on the failed gear leg and the right wing tip tank.

Good visual flight rule (VFR) conditions existed at the time of the accident. The runway surface was smooth dry asphalt. The aircraft weight and centre of gravity were within the prescribed limits.

The right main landing gear had become detached from the support structure. Improper securing of the forward landing gear truss attaching shaft enabled the shaft to move clear of the truss assembly. Once detached, the right main landing gear leg collapsed rearward. Aircraft records indicated that the right main landing gear was installed in February 1981 during repair of damage incurred on a hard landing.

FINDINGS:

Cause Related:
1. The aircraft's right main landing gear leg became detached during landing, causing the aircraft to settle onto the displaced gear leg and the wing tip fuel tank.

2. A securing device had been improperly positioned when the forward truss attaching shaft and gear leg assembly were last installed. The installation error had not been detected during maintenance and inspection.

Other:
- Nil -

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WINNIPEG FLYING CLUB
CESSNA 172N C-GDIB
BERENS RIVER, MANITOBA
21 SEPTEMBER 1985

BRIEF NUMBER: 85-C50075 (Accident)
LOCAL TIME: 0942 CDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	100	40
LAST 90 DAYS	8	8

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

REPORTED CIRCUMSTANCES:

The pilot was landing on a 2,900-foot strip in cross-wind conditions. After touchdown, the aircraft swung sharply, left the runway, and crossed a drainage ditch, incurring substantial damage to the landing gear and propeller.

There were no injuries. The weather briefing indicated that surface winds at destination would be from 7 to 10 knots. As he approached the airport, the pilot was advised by the UNICOM operator that there was a 90-degree cross-wind at 14 knots. This was within tolerances for both the aircraft and the runway in use. (The airport licence is not valid when the cross-wind exceeds 15 knots.) A special weather observation was taken immediately following the accident which showed the wind speed as gusting to 24 knots.

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BISSETT AIR SERVICE LTD.
CESSNA A185F C-GEBY
SCOTT LAKE, MANITOBA 2 mi S
06 OCTOBER 1985

REPORT NUMBER: 85-C50085 (Accident)
INFORMATION SOURCE Field Investigation
LOCAL TIME: 1300 CST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	915	60
LAST 90 DAYS	200	60

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot, on a visual flight rules (VFR) charter flight, descended from cruising altitude, and had just levelled off at 800 feet above ground level (agl), when the aircraft engine (Continental IO-520-D) lost all power, and a forced landing was carried out. The float-equipped aircraft crashed into trees near a lake on which the pilot was trying to land.

Fuel distributors, fuel filters, fuel lines, and fuel tanks were intact and functional. There was no fuel found in these components, nor were there any fuel stains found on the ground near the aircraft. This model of Cessna 185 carries three gallons of unusable fuel. After the crash, the pilot noted there was fuel draining out of the right tank area.

The pilot, certain of his fuel load, did not dip the aircraft fuel tanks prior to departure. He did, however, look into the tanks, and he drained the fuel sumps.

Without a known reference point, the amount of fuel in a tank cannot be determined with any degree of accuracy by a visual check. The angle of the aircraft was such that the unusable fuel in the tank may have drained out the fuel vent. The lack of any fuel in the fuel system is evidence that fuel exhaustion occurred.

FINDINGS:

Cause Related:
1. The engine lost power because of fuel exhaustion.

Other:
-Nil-

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BARD AIR CORPORATION
BEECH C-45H N404TH
LESTER B. PEARSON INTERNATIONAL AIRPORT,
TORONTO, ONTARIO
15 OCTOBER 1985

REPORT NUMBER: 85-O50906 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1000 EST
OPERATION: International Charter
DAMAGE: Substantial
PILOT LICENCE: Airline Transport (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	7,000	200
LAST 90 DAYS	400	200

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot landed the Volpar Turbo 18 aircraft on runway 15 and used full reverse power and brakes in order to turn right onto runway 24R. At a ground speed of 20 to 25 knots, and just as the pilot was starting to come out of reverse, the left main landing gear collapsed. The aircraft came to rest at the intersection of runways 15 and 24R, 1,230 feet from the runway threshold.

The cloud base was about 600 feet above ground level, the visibility three miles in fog, the wind from 210 degrees at six knots and the temperature 12 degrees Celsius. The runway was wet. It was concluded that no weather factors contributed to this accident.

The Volpar conversion changed the landing gear from a tail wheel to tricycle configuration. The landing gear collapsed rearward because the walking beam, which forms part of the landing gear actuating and locking mechanism, broke.

Laboratory examination of the walking beam, the pivot bolt, and the connecting drag link and analysis of the findings revealed the following:

1. the walking beam failed in a ductile overload manner;

2. there were no pre-existing defects;

3. there was a significant degree of material deformation associated with the failure;

4. the pivot bolt was bent in such a manner that it had to have occurred when the walking beam failed;

5. there were no material deficiencies found; and,

6. the direction of failure was consistent with a levering action of the pivot point in an aft direction, most likely the result of abnormal loading conditions.

The landing gear system experienced forces during landing of sufficient magnitude to cause the walking beam to fail in overload. The reason for the excessive forces could not be determined.

The following laboratory report was completed:
LP 242/85 - Main Landing Gear Walking Beam, Volpar Turbo 18 N404TH.

FINDINGS:

Cause Related:
1. During the landing roll, the left landing gear walking beam failed in a ductile overload manner and allowed the left landing gear to collapse rearward.

2. The reason for the overload could not be determined.

Other:
- Nil -

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CESSNA 180J C-GSOX
HEYDON BAY, BRITISH COLUMBIA
26 OCTOBER 1985

REPORT NUMBER: 85-P50048 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1350 PDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Senior Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	13,500	3,000
LAST 90 DAYS	40	30

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

SUMMARY REPORT:

As the pilot was descending towards destination, the engine (Continental 0-470R-25A) stopped, and efforts by the pilot to restore power were not successful. The pilot made a forced landing approach to a suitable area of water. The approach was made at a relatively high airspeed (over 100 knots), and, as the pilot began to flare the aircraft, it touched down on the glassy water. The floats dug in, and the aircraft nosed over and sank in deep water. The pilot, although seriously injured, managed to swim to shore.

The cause of the engine failure could not be determined as the aircraft has not been recovered. The floats dug into the water because of the nose-low attitude resulting from the high speed approach and because the pilot did not complete the flare before the aircraft touched down. The glassy water made it difficult for the pilot to judge his height above the surface.

FINDINGS:

Cause Related:
1. The engine failed for undetermined reasons, resulting in a forced landing.

2. Because of the glassy water conditions, the pilot misjudged his height above the water and flared the aircraft too late.

Other:
-Nil-

* * * * *

CESSNA 172M C-GVNG
SOREL, QUEBEC
10 NOVEMBER 1985

REPORT NUMBER: 85-Q50060 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1403 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	62	62
LAST 90 DAYS	7	4

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

The aircraft swerved to the left during take-off and the left wing dropped and struck a runway light. The pilot applied full right rudder and aileron; the right wing then dipped sharply and hit the ground. The nose wheel was torn off and the aircraft came to rest about 250 feet from the runway.

The controls were in good operating condition before the impact. The total weight of the aircraft was 2,435 pounds, or about 6% above the maximum allowable take-off weight of 2,300 pounds. The pilot took off at about 55 knots. At that speed and a weight of 2,435 pounds, the aircraft was on the back side of the power curve.

At the normal take-off speed, the aircraft had a steep angle of attack because its weight exceeded the maximum allowable weight; it was on the back side of the power curve. Because of the strong drag forces resulting from the steep attack angle, the speed fell and the rudder became ineffective.

The pilot did not increase pressure on the right pedal sufficiently to counteract the propeller slipstream and the aircraft began to yaw to the left. This yawing movement induced a roll to the left and the left wing struck a runway light as it dropped. When the pilot pushed the right pedal fully down the aircraft began to spin; the right wing dipped and struck the ground hard.

FINDINGS:

Cause Related:

1. The aircraft was overloaded and on the back side of the power curve immediately after take-off, and its speed fell.

2. The aircraft swerved to the left because of the propellor slipstream and struck a runway light.

3. The pilot induced an incipient spin by suddenly applying full right rudder; the right wing then dipped.

Other:
-Nil-

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CUBANA AIRLINES
ILYUSHIN IL62M CU-T1208
GANDER AIRPORT, NEWFOUNDLAND
30 NOVEMBER 1985

REPORT NUMBER: 85-A54968 (Incident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1812 NST
OPERATION: Scheduled International
DAMAGE: None
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	Unknown	Unknown
LAST 90 DAYS	Unknown	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	Unknown
PASSENGERS	-	-	Unknown

HISTORY OF THE FLIGHT:

While attempting to land on runway 04, after the completion of an instrument flight rules (IFR) front course instrument landing system (ILS) approach, the captain landed the aircraft in the grass, 10 feet to the right of the runway. The aircraft touched down 3,450 feet from the threshold and travelled for 1,700 feet in the grass, before the pilot returned the aircraft to the runway. The aircraft was not damaged; two runway edge lights were broken.

PERTINENT INFORMATION:

The weather was reported to be ceiling partially obscured, measured 700 feet overcast, with the visibility one mile in light drizzle, light snow, and fog, and the wind was 345 degrees magnetic at 14 gusting to 20 knots.

As reported by the captain, the crew had attempted two back course ILS approaches to runway 31, with landing limits of 300 feet and one mile visibility. Both approaches terminated in overshoots because the crew did not have adequate visual reference with the runway environment.

The captain stated that he then elected to execute a front course ILS approach to runway 04 and accept the cross-wind, as the landing limits were lower (200 feet and one-half mile visibility). The approach was normal; however, during the landing flare, the aircraft drifted to the right. In spite of the corrections made by the captain, the aircraft continued to drift to the right and landed 10 feet to the right of the runway.

ANALYSIS:

The restricted visibility made drift detection difficult, and the corrections made by the captain were too small and too late to ensure that the aircraft landed on the runway.

FINDINGS:

Cause Related:

1. The captain continued the landing, even though the drift had not been eliminated.

2. Adequate drift correction to compensate for the cross-wind was not applied, and, as a result, the aircraft drifted to the right and landed beside the runway.

3. The restricted visibility made drift detection difficult.

Other:

-Nil-

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AUSTIN AIRWAYS LTD.
DOUGLAS DC-3 C-GNNA
SACHIGO LAKE AIRPORT, ONTARIO
19 JANUARY 1986

REPORT NUMBER: 86-H60002

SYNOPSIS

The aircraft, with two crew members, two passengers, and a load of cargo, struck a 150-foot-high radio tower, while the crew was manoeuvring to land in poor weather. As the aircraft then became difficult to control, the crew carried out a wheels-up forced landing. During the landing, the cargo of drums containing automotive gasoline broke free, causing damage and trapping the passengers. Once the drums were moved, the passengers were able to leave the aircraft through the cockpit escape hatch. The pilot-in-command and a passenger were seriously injured.

The Canadian Aviation Safety Board determined that the flight was continued into below VFR weather conditions. In addition, it was determined that the cargo had not been secured in accordance with the requirements of the company's operating certificate.

CONCLUSIONS

Cause-Related Findings

1. The crew initiated a VFR flight based on weather forecasts indicating that suitable weather conditions would exist for the duration of the flight.

2. En route weather conditions deteriorated below those required for VFR flight.

3. The flight was continued into below VFR weather conditions.

4. During an attempt to navigate using the automatic direction finding equipment and to maintain visual reference with the ground, the pilot manoeuvred at a low altitude, and the aircraft struck the NDB tower.

5. A wheels-up forced landing was carried out because the crew was having difficulty controlling the aircraft and was uncertain about the damage sustained in the collision.

6. The passenger's injuries would have been reduced had a shoulder harness been worn.

Other Findings

1. The cargo was not adequately secured.

2. The crew was certified and qualified for the flight in accordance with existing regulations.

3. The aircraft was certified, equipped, and maintained in accordance with existing regulations and approved procedures.

4. There was no evidence of any airframe failure or system malfunction prior to or during the flight.

5. The aircraft's weight and centre of gravity were within the prescribed limits.

SAFETY ACTION

Action Required

Information Regarding Cargo Restraint

The cargo in the accident aircraft did not remain restrained during the forced landing. While the pilot-in-command was responsible for the safe conduct of the flight, he did not have adequate information to ensure that all the required conditions for the flight were being met. Company management and Transport Canada officials had the opportunity to ensure that there was adequate information available to company personnel regarding cargo restraint the former when they sought approval from Transport Canada for the aircraft to be flown with cargo handlers and freight on board; and the latter when they approved, by means of an operating certificate (OC) amendment, the methods by which the operations were authorized to be conducted. Apparently no one recognized that there was inadequate information to ensure that the conditions of the OC amendment could be met.

Of the ten conditions specified in the OC amendment of 08 April 1982 for the carriage of cargo handlers and freight, only the requirement to adequately restrain cargo could not be evaluated during company audits subsequent to the OC amendment. Furthermore, there were no Transport-Canada-approved guidelines for company personnel to follow to ensure the proper restraint of cargo.

While compliance with the conditions of the OC must rest with the company, the Department of Transport is responsible for assuring that the conditions are being met, or that there are sufficient guidelines available to company personnel for the conditions to be met.

Without such procedures in the approval or audit process, the Department of Transport cannot responsibly exercise its authority. In the case of cargo restraint in operations involving the carriage of cargo handlers and freight, proof of the company's ability to comply with the conditions of the OC could have been submitted and evaluated upon application for authority to conduct the operations. The Board believes the absence of such procedures to be a safety deficiency.

Accordingly, the CASB recommends that:

The Department of Transport amend procedures for authorizing the carriage of persons and cargo to include the requirement for the applicant to submit for departmental approval guidelines or instructions that will be available to company personnel for the restraint of cargo; and

(CASB 86-24) – citation

The Department of Transport require that all companies approved for the carriage of persons and cargo meet the criteria proposed in CASB 86-24.

(CASB 86-25) – citation

Safety Concern

Pilot Judgement: VFR Flight in IFR Weather

The decision by an experienced commercial pilot to continue VFR flight in IFR weather conditions is cause for the ongoing concern of the CASB. The CASB has reviewed a number of occurrences with marked similarities to this accident. For example, two previous accidents (refer to reports 84-H40004 and 84-H40005) involved experienced pilots who were familiar with northern operations, flying in remote locations under visual flight rules in poor weather conditions. The weather conditions deteriorated to the extent that the accident aircraft struck weather-obscured objects or terrain in controlled flight.

Past and ongoing measures by Transport Canada to prevent such accidents include the development of programs to help pilots understand and cope with the influences which affect decision-making in the cockpit; promotional campaigns which publicize the hazard of "pushing the weather"; and the improvement of facilities for observing and communicating weather conditions at remote locations. While the Board recognizes the complexity of preventing weather-related accidents, it believes that further measures are necessary to reduce their frequency.

The CASB is investigating this matter further, and recommendations may be forthcoming.

This report and the aviation safety action therein has been adopted by the Chairman, Mr. Bernard M.-Deschênes, Q.C. and Board Members:

Norman Bobbitt
Roger Lacroix
David Mussallem
Arthur Portelance
Bruce Pultz
Ross Stevenson
Frank Thurston

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GOGAL AIR SERVICE
CESSNA A185F C-GEUU
BURNTWOOD LAKE, MANITOBA
25 MARCH 1986

REPORT NUMBER: 86-C60021 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1725 CST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,000	1,200
LAST 90 DAYS	70	70

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT

The pilot carried out a ski landing on a snow-covered lake. Touchdown was normal, but, during the landing roll, the aircraft slowly settled to the right. The pilot selected the mixture to idle cut-off, but, before the propeller had stopped rotating, it struck the right ski, and the wing tip contacted the snow. The aircraft continued on a straight course, coming to rest about 600 feet from the touchdown point.

Examination revealed that the outer bracket on the right gear leg attachment failed for undetermined reasons.

FINDINGS:

Cause Related:
1. During a ski landing on a frozen lake, the outer bracket on the right gear leg attachment failed for undetermined reasons.

Other:
- Nil -

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CESSNA 172N C-GYLA IROQUOIS FALLS AIRPORT,ONTARIO
28 MARCH 1986

BRIEF NUMBER: 86-O60011 (Accident)
LOCAL TIME: 1345 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	70	55
LAST 90 DAYS	2	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

REPORTED CIRCUMSTANCES:

The pilot landed the aircraft on runway 14, in winds that were from 180 to 230 degrees at 12 to 20 knots. During the landing roll, the pilot lost control of the aircraft, and it collided with a snowbank and nosed down.

The runway was 4,000 feet long, asphalt surfaced, and in good condition. The cross-wind was greater than the maximum recommended for light aircraft in the Transport Canada Aeronautical Information Publication.

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TRANS PROVINCIAL AIRLINES DEHAVILLAND DHC-2 BEAVER C-GHCS PRINCE RUPERT AIRPORT, BRITISH COLUMBIA 5 mi NNW
08 APRIL 1986

REPORT NUMBER: 86-P60014 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0633 PST
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,400	1,400
LAST 90 DAYS	225	190

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The float-equipped aircraft departed on a 30-minute visual flight rules (VFR) flight from Seal Cove, British Columbia to Masset. After flying for about 15 minutes in deteriorating weather (low cloud ceilings and snow), the pilot turned back toward Seal Cove. Six miles from Seal Cove, the pilot flew into a blind cove and crashed while attempting to turn around. During the crash sequence, the left float, the rear half of the right float, and the right wing were torn off.

The weather on departure was four miles visibility in fog; however, the pilot commenced the flight, expecting the weather to improve once he reached open water. Instead, the weather continued to deteriorate. Ice formed on the airframe, and, as a result, the airspeed dropped from 115 mph to 85 mph, and a nose-high attitude was required to maintain level flight. Because of the reduced visibility due to the aircraft's attitude and the weather, the pilot inadvertently flew into the blind cove. When he attempted to turn around at low altitude, the ice-laden aircraft could not maintain flight and crashed. Although the water he had just overflown would have allowed a safe landing, the pilot thought he could safely reach home base.

The ELT activated on impact but was ineffective due to the antenna breaking off in the crash.

FINDINGS:

Cause Related:
1. As a result of poor visibility, the pilot flew into a blind cove and crashed while attempting to turn around.

2. Ice on the aircraft reduced its performance.

Other:
1. The ELT was ineffective due to the antenna breaking off.

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BI-AIR APPLICATION SERVICE
GRUMMAN A 164 AG-CAT C-GWND
BUCK MOUNTAIN, ALBERTA
17 MAY 1986

REPORT NUMBER: 86-W60011 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1630 MDT
OPERATION: Specialty Aerial Application and Distribution
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,350	800
LAST 90 DAYS	2	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft took off into wind from a country road, and the pilot commenced a left turn to proceed to the area to be spray seeded. The pilot reduced power in the turn, and the aircraft began to descend. Full power was applied, but the descent continued. The dump handle was pulled to jettison the mixture of fertilizer and wet clover seed, but the aircraft continued to descend. After crossing a field at low altitude, the aircraft collided with trees, descended into a creek bed, and overturned.

The take-off weight was not calculated by the pilot prior to the flight.

The flight path and height of the aircraft over the downsloping terrain after the left turn indicated that the aircraft did not get out of ground effect. There is also a possibility that, after the initial power reduction, which the pilot routinely carried out, the angle of attack increased to the point where the power available was not sufficient to overcome drag. The all-up weight of the aircraft was not determined; however, near maximum gross weight may have contributed to the inability of the aircraft to climb at reduced power after lift-off.

When the dump handle was actuated, the hopper door opened; however, the hopper contents did not jettison from the aircraft. A concentration of fertilizer and wet seed at the hopper door had obstructed the opening.

FINDINGS:

Cause Related:
1. The pilot reduced power momentarily after the climb was initiated and before a safe climb speed was achieved.

2. The pilot was unable to dump the load because the fertilizer and wet clover seed obstructed the dump opening.

3. At the reduced power setting and high angle of attack, the aircraft would not climb, and it struck trees.

Other:
1. The pilot did not calculate the take-off weight of the aircraft.

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R.D.N. FLIGHT PROGRAMS INC.
CESSNA 150 C-FIGC
MIDLAND AIRPORT, ONTARIO
05 JUNE 1986

BRIEF NUMBER: 86-O60043 (Accident)
LOCAL TIME: 1950 EDT
OPERATION: Specialty Recreational Flying
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	117	80
LAST 90 DAYS	8	1

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

REPORTED CIRCUMSTANCES:

After a 20 minute sightseeing flight, the aircraft joined the circuit for runway 34 as the number two aircraft to land. The aircraft's radio transceiver had been removed for repairs, and, as a result, the pilot was unaware of the number one aircraft pilot's intentions, nor did he know if the other pilot was aware of his presence. He decided to land close to the threshold to ensure sufficient separation between himself and the number one aircraft, which had already landed and was approximately three quarters of the way down the runway. The aircraft landed eight feet short of the runway, and when the nosewheel contacted the runway edge, the aircraft bounced into the air in a nose high attitude. The aircraft landed heavily, and the nose gear collapsed.

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DE HAVILLAND DHC 2 BEAVER C-FBBG
WAWA LAKE, ONTARIO
12 JUNE 1986

REPORT NUMBER: 86-O60045 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2000 EDT
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	PILOT-IN-COMMAND		CO-PILOT	
	ALL TYPES	ON TYPE	ALL TYPES	ON TYPE
TOTAL	6,254	3,120	495	0
LAST 90 DAYS	100	85	35	0

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

The captain, who occupied the right seat, was giving the co-pilot a type rating on a company float-equipped aircraft. The aircraft was flown to Wawa Lake, where the co-pilot was to practise touch-and-go landings on the lake. On the first landing, the aircraft touched down normally, but shortly thereafter, the left float dug into the water. The captain reached to the left and pulled back on the controls in an attempt to control the aircraft, but the aircraft veered sharply to the left, and the left wing struck some trees along the shore.

There were no rudder pedals installed at the right seat of this aircraft. Aileron and elevator control can be exercised from the right seat by rotating the left seat controls to the right side. The co-pilot had 150 hours on smaller float-equipped Cessna aircraft. Because of the co-pilot's previous float experience and familiarization, the captain felt he could supervise the check-out without access to the flight controls.

The co-pilot had flown for 10 hours in the right seat prior to this accident, and during this time, he had received some familiarization in the air handling of the aircraft but had not carried out any landings or take-offs.

The recommended landing technique on this type of aircraft and on most float-equipped aircraft is to maintain back pressure on the control column after touchdown, to ensure that the floats do not dig into the water. In this case, possibly because of his unfamiliarity with the larger aircraft, the co-pilot relaxed the back presssure after touchdown, thus allowing the left float to dig into the water. The captain, in the right seat, did not have satisfactory means of controlling the aircraft, and, although he attempted to reach to the left and regain control of the aircraft, he was unsuccessful, and the aircraft swung left and struck trees on the shoreline.

FINDINGS:

Cause Related:
1. The co-pilot, who was at the controls, did not use the recommended landing technique, and, as a result, the left float dug into the water, and the aircraft veered left and struck the trees.

2. The captain did not have the flight controls at his position and was unable to provide control input assistance during landing.

Other:
-Nil-

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BI-AIR APPLICATION SERVICES LTD.
CESSNA 188 AGWAGON C-GMTG
LLOYDMINSTER, ALBERTA 14 mi SW
26 JUNE 1986

REPORT NUMBER: 86-W60023 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2230 MDT
OPERATION: Specialty Aerial Application and Distribution
DAMAGE Substantial
PILOT LICENCE Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	7,000	33
LAST 90 DAYS	50	33

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was landing on a road 40 minutes after sunset. During the landing roll, the left wing tip contacted bushes on the side of the road. The aircraft swerved to the left and nosed into the ditch.

Both sides of the road were clear of obstructions within 50 feet of the centre line, with the exception of a 120-foot stretch where bushes were within 18 feet of the centre line of the road. The pilot maintained the centre of the road; however, the bushes were within the wing span of the aircraft. Wheel marks, suggesting heavy braking, curved from the centre line of the road to the final impact point.

The pilot wanted to land in the area free from obstructions; however, he overran his intended landing area. The bushes were not easily discernible because of darkness.

FINDINGS:

Cause Related:
1. The pilot could not clearly see the landing area because of darkness, and he landed in an unsuitable area.

Other:
-Nil-

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KINNIBURG SPRAY SERVICE
PIPER PA-25-235 PAWNEE C-GWTP
SPRING COULEE, ALBERTA 4 mi SE
19 JULY 1986

REPORT NUMBER: 86-W60038 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1210 MDT
OPERATION: Specialty Aerial Application and Distribution
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	475	160
LAST 90 DAYS	200	140

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was making a low-level, into-wind, procedure turn to return to the field he was spraying. As the pilot looked back to check his position with a field marker, the aircraft descended into the rising terrain. The wind was gusting at 20 to 25 knots at the time of the occurrence. The aircraft encountered subsiding air on the lee side of a hill. The pilot's brief inattention from flying the aircraft at low level over the rising terrain allowed the aircraft to commence a rate of descent from which the pilot could not recover prior to the aircraft's striking the ground.

FINDINGS:

Cause Related:
1. While in a low-level turn, the aircraft encountered subsiding air over rising terrain.

2. During the turn, the pilot's attention was diverted from flying the aircraft.

Other:
-Nil-

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CESSNA C172M C-GAMP
EDGERTON, ALBERTA 9 mi SSW
07 JULY 1985

REPORT NUMBER: 85-W50033 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1615 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	541	476
LAST 90 DAYS	30	30

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The Cessna was taking off into a 15-knot, 50-degree left cross-wind. Shortly after lift-off, and as the aircraft came abeam a hangar and grove of trees, the Cessna suddenly nosed over on the ground. The nosewheel struck the ground first, and the wheel and fork assembly separated from the aircraft. The nosewheel oleo strut dug into the ground, and the Cessna came to rest on the runway in a nose-down position.

The hangar and trees situated to the left of the runway sheltered the mid-section of the runway from the cross-wind. As the aircraft lifted off, it encountered wind shear as it entered into the lee of the hangar and trees. The aircraft stalled and struck the runway.

FINDINGS:

Cause Related:
1. The aircraft experienced wind shear shortly after take-off; it then stalled and struck the runway.

Other:
-Nil-

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ERCO 415C C-FRPH
NIVERVILLE, MANITOBA 1 1/2 mi S
08 JULY 1985

REPORT NUMBER: 85-C50054 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2000 CDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL:	275	215
LAST 90 DAYS	5	5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	1	-

SUMMARY REPORT:

The pilot turned onto final approach, reduced power, and commenced descent for a touchdown on a farm strip. To adjust the rate of descent, the pilot advanced the throttle, but there was no response. A forced landing was carried out in a wheat field, one-half mile short of the airstrip. The pilot and passenger were seriously injured.

Inspection of the aircraft revealed that the grommet in the firewall that shields the flexible throttle cable outer housing had pulled out of place. The throttle cable outer housing had chafed through and broken. As a result of the break in the housing, when the throttle was pushed in to increase power, the cable buckled near the mid-portion of its length, and the movement was not transmitted to the throttle arm. Although the throttle linkage was in an extremely difficult area to inspect, the chafing should have been detected during a previous inspection.

FINDINGS:

Cause Related:
1. The throttle cable outer shield was worn away by chafing on the firewall, and power could not be applied because of the defective throttle cable.

2. Previous inspections failed to uncover the hazard.

Other:
- Nil -

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CHAMPION 7EC C-FLIE
HARE INDIAN RIVER,
NORTHWEST TERRITORIES
17 JULY 1985

REPORT NUMBER: 85-W50040 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0100 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	260	90
LAST 90 DAYS	60	60

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot took off from Norman Wells, Northwest Territories (NWT) on a visual flight to Ford Bay, NWT. The flight encountered deteriorating weather, and the pilot became lost. He turned around to head back to Norman Wells; however, the engine (Lycoming D-235-C) started to misfire, and the pilot decided to land. The landing surface, a glacier, was rough and uneven, and the right landing gear collapsed during the landing run.

The investigation did not reveal any pre-accident malfunction or failure other than the engine misfire. It was not determined why the engine misfired.

The weather at take-off time was good, with scattered clouds at 1,500 feet and visibility more than 25 miles. At about the half-way point, the cloud base lowered to 500 feet or less, and the visibility was reduced to near zero at times in heavy rain and fog.

FINDINGS:

Cause Related:

1. The pilot encountered deteriorating weather and became lost.

2. The aircraft engine misfired occasionally for undetermined reasons.

3. The pilot decided to land because he was lost and the engine was not operating properly.

4. The aircraft sustained damage during the precautionary landing because of the rough landing surface.

Other:
-Nil-

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CHAMPION 7GCAA C-FUMR
KAMLOOPS, BRITISH COLUMBIA 10 mi E
19 JULY 1985

REPORT NUMBER: 85-P50030 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1515 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	125	37
LAST 90 DAYS	30	30

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

Following a sightseeing trip, the pilot decided to land on a 1,500-foot long, 15-foot wide strip prior to returning to his departure point. During the landing roll, the aircraft veered sharply to the right off the runway towards a fence located 100 feet to the right and parallel to the runway. The pilot applied power, and, as directional control was being re-established, the right wing struck a fence post. The aircraft swung through 180 degrees, and the right gear collapsed, jamming the only exit door of the aircraft. The occupants had to exit via a side window.

The initial 500 feet of the airstrip consisted of gravel and large stones; the remainder of the strip was asphalt. Examination of the landing area after the accident revealed that the aircraft touched down on the gravel area slightly to the left of the runway centre line, which placed the aircraft's left gear in the grass off to the side of the strip. As the aircraft transitioned to the asphalt section, the right gear contacted a small lip between the gravel and the asphalt, while the left gear tracked just to the left of the paved surface.

The investigation determined that the pilot landed off the centre line of a narrow runway and lost directional control when the right gear contacted the asphalt surface. When the pilot corrected the swing and returned the aircraft to a heading parallel to the runway, the aircraft was displaced to the right, and the wing struck the fence.

FINDINGS:

Cause Related:

1. The pilot touched down off the centre line of a narrow runway and lost directional control when the right gear contacted the beginning of the asphalt surface.

Other:
-Nil-

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AERONCA 11AC C-FEPA
TEULON, MANITOBA 5 mi SE
19 JULY 1985

REPORT NUMBER: 85-C50060 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 2015 CDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	89	32
LAST 90 DAYS	8	8

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot was carrying out a local pleasure flight. During final turn on return to land at a private grass strip, the aircraft's main landing gear became entangled in a wheat crop located to the right of the runway approach path, and the aircraft nosed over.

The winds at the time of the accident were calm. The aircraft weight and centre of gravity were within limits, and no aircraft discrepancies were reported.

The angle of furrows in the wheat indicate that the aircraft was still on final turn when it contacted the wheat. The pilot stated that, on final turn, he was concerned about a line of trees near the left side of the approach to the runway. The pilot was distracted by the trees, and he allowed the aircraft to settle while on final turn. The main landing gear became entangled in the wheat, causing the aircraft to nose over.

FINDINGS:

Cause Related:
1. While on final turn to land, the pilot failed to maintain obstruction clearance, and the aircraft's main landing gear contacted wheat, causing the aircraft to nose over.

Other:
- Nil -

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ERCO 415D C-FEQO
ROBLIN, MANITOBA 1 mi S
21 JULY 1985

REPORT NUMBER: 85-C50059 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 0135 CDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	151	134
LAST 90 DAYS	26	25

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot, with one passenger on board, was conducting a night flight in the local area when he became concerned about his fuel supply and decided to land at a nearby airport to refuel. He attempted to call the local flight service station to ensure that the runway lights were on, but he could not make radio contact. On arrival, over what the pilot thought was the airport, he discovered his actual position was over a town, 30 miles to the north. He elected to carry out a precautionary landing on a grid road. On landing, the left wheel struck the soft shoulder of the road. The aircraft left the road, crossed a ditch and struck a fence.

The pilot reported that the fuel quantity indicating system on this aircraft is inaccurate and that time flown is the only accurate way to estimate fuel quantity. When the aircraft was over the town, the fuel gauge showed almost empty, and a calculation of time flown indicated that minimum fuel remained. As a result, the pilot felt that there was insufficient fuel to fly to the airport, and he decided to carry out a precautionary landing rather than risk running out of fuel en route.

When the fuel situation became critical, the pilot headed for a large centre where he believed the airport was located. It was a moonless night, and the pilot became disorientated even though he was familiar with the area. When the left wheel struck the shoulder of the road, the pilot was unable to maintain directional control of the aircraft. It was determined later that the aircraft's radio receiver was unserviceable.

FINDINGS:

Cause Related:
1. The pilot became unsure of his position while navigating on a dark moonless night.

2. The pilot was unable to determine the exact amount of fuel remaining because of an inaccurate fuel quantity indicating system.

3. The pilot decided to carry out a precautionary landing rather than risk a forced landing at night.

Other:
1. The aircraft's radio receiver was unserviceable.

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PIPER PA-28-140 CF-FJK
CARMACKS, YUKON 41 mi NW
23 JULY 1985

REPORT NUMBER: 85-W50043 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1630 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	140	47
LAST 90 DAYS	16	16

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The pilot was preparing to depart from a 1,450-foot dirt and gravel strip. The aircraft engine was run up to full power, and then the brakes were released. As the aircraft began to roll, the pilot pulled back on the control column to take the weight off the nosewheel. After a ground run of 1,150 feet, the pilot pulled the aircraft into the air at 85 mph and commenced a climb. When the aircraft was at an altitude of approximately 30 feet, the aircraft rolled to the right and began to descend. The pilot was unable to stop the descent, and the aircraft struck some small trees at the end of the runway and nosed over.

The airstrip is oriented 210 degrees magnetic and is at an elevation of 2,300 feet above sea level (asl). The density altitude at the time of the accident was 2,900 feet. The approach and departure ends of the airstrip are both obstructed by small trees, and the terrain rises at both ends. The surface of the runway is hard-packed dirt from the centre to the departure end; the remainder is loose stone. The runway has a two-degree upslope and was wet from a recent rainfall. The pilot had not used the strip for take-off before, and he was unsure of its length. Because of this uncertainty, he paced off the runway prior to departure and estimated the length to be 1,600 to 1,700 feet.

According to the manufacturer's performance charts, for the aircraft's weight of 2,050 pounds at a density altitude of 2,900 feet, the take-off ground run required is 1,350 feet, and a distance of 2,350 feet is required to clear a 50-foot obstacle. These figures apply to a level paved runway.

The pilot did not use flaps for the take-off. The manufacturer recommends 25 degrees of flap for take-off from short, soft, obstructed airstrips. The aircraft should be allowed to accelerate to 50 to 60 mph before the pilot eases back on the control column to lift off at the lowest possible speed. The pilot should then allow the aircraft to accelerate just above the ground to 74 mph, the best angle-of-climb speed, and then climb at this speed until the aircraft is clear of all obstacles.

The runway length was insufficient to allow the aircraft to clear the obstacles at the departure end, particularly considering the degradation of the aircraft's take-off performance as a result of the runway upslope, loose gravel, and density altitude. The pilot did not follow the recommended take-off procedures, in that flaps were not used, and the appropriate acceleration techniques, both on the runway and after lift-off, were not used. Once airborne, it is likely that the pilot attempted to climb too steeply because of his perception of the proximity of the rising terrain ahead. As a result, the airspeed decayed, and the aircraft stalled.

FINDINGS:

Cause Related:

1. The pilot attempted a take-off on a runway of insufficient length to clear obstacles at the departure end.

Other:

1. The pilot did not use the manufacturer's recommended take-off procedures for this runway surface and environment.

2. Aircraft performance was degraded as a result of the runway slope, loose gravel, and density altitude.

* * *

PIPER PA-18 SUPER CUB N1620A
BURWASH, YUKON TERRITORY 93 mi N
27 JULY 1985

REPORT NUMBER: 85-W50903 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1830 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial (U.S.A.)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	500	250
LAST 90 DAYS	28	15

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was taking off from a narrow grass strip, and, as the aircraft was nearing lift-off speed, the left wing struck a clump of willows. The aircraft swung left 90 degrees and slid sideways in the direction of take-off. The main landing gear became detached, and the aircraft came to rest on its fuselage and right wing tip.

The NARCO model ELT 10 emergency locator transmitter (ELT) was activated in the occurrence and was not switched off by the pilot who was flown out of the strip by another pilot. The ELT signal was pinpointed by SARSAT. An aircraft was dispatched to the scene by rescue authorities only to find the wreckage deserted.

The take-off attempt was made into a light wind, and no pre-occurrence discrepancies were found with the aircraft.

The grass strip was 1,400 feet long with the centre 10 feet comprised of compacted grass. Tall grass 10 to 18 inches high extended for 18 feet on each side of the compacted grass. A clump of willows, 12 feet in height, was situated 25 feet to the left of the strip centre line, 450 feet from the departure end.

While taxiing to the take-off point, the pilot inadvertently lined the aircraft up to the left of the compacted centre portion of the strip. The take-off alignment did not provide for adequate wing tip clearance from the willows bordering the left side of the strip. During the attempted take-off, the long grass prevented the aircraft from accelerating to take-off speed in time to avoid the clump of willows.

FINDINGS:

Cause Related:
1. During the take-off, the pilot did not position the aircraft on the centre of the grass strip, and, as a result, the left wing struck trees.

Other:
1. The pilot left the scene of the accident without deactivating the ELT.

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PIPER PA-25-235 PAWNEE C-GECL
CARMAN, MANITOBA 5 mi SW
27 JULY 1985

REPORT NUMBER: 85-C50065 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2115 CDT
OPERATION: Private Aerial Spray
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	800	200
LAST 90 DAYS	140	100

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was departing from a grid road on a westerly heading to spray crops. During lift-off, the pilot heard a popping noise from the engine. While the pilot was checking the magnetos and engine instruments, the aircraft drifted left. The pilot attempted to correct the drift, and the aircraft overflew the road surface. The right wheel came into contact with a ditch on the other side of the road; the aircraft continued across the ditch and through a bordering fence, coming to rest in a field.

An examination of the engine did not reveal any pre-impact failure.

The pilot made no attempt to pull the dump valve, which would have jettisoned the chemical he was carrying, nor did he attempt to reject the take-off when he first perceived a problem. The pilot stated that, when he realized the aircraft was drifting, he overcontrolled, and, as a result, the aircraft struck the ditch.

FINDINGS:

Cause Related:
1. During lift-off, the pilot was distracted by an unusual engine noise, and he allowed the aircraft to drift.

2. While attempting to manoeuvre the aircraft back over the road, the pilot overcontrolled, and, as a result, the aircraft struck a ditch.

3. The pilot did not attempt to reject the take-off or dump the chemical spray.

Other:
-Nil-

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COLLISION BETWEEN AERO COMMANDER LARK 100/180 CF-ZZL and CESSNA 172M N-92045
TORONTO ISLAND AIRPORT, ONTARIO
30 JULY 1985

LOCAL TIME: 2115 EDT
INFORMATION SOURCE: Field Investigation

AERO COMMANDER LARK 100/180 CF-ZZL
REPORT NUMBER: 85-O50801 (Accident)
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	185	64
LAST 90 DAYS	42	42

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

CESSNA 172M N-92045
REPORT NUMBER: 85-O50802 (Accident)
OPERATION: Private Recreational
DAMAGE Substantial
PILOT LICENCE Private (U.S.A.)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	203	50
LAST 90 DAYS	35	35

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The Cessna, which had just landed at night on runway 08 at Toronto Island Airport, had cleared the runway, and was taxiing east on taxiway Bravo. The Aero Commander had been cleared to land on runway 08 but landed on taxiway Bravo. During the landing roll-out, the Aero Commander overtook the Cessna on the taxiway, and the two aircraft collided. Both aircraft swung to the left following the collision and came to rest on the north edge of the taxiway.

The west half of taxiway Bravo is designated as an apron area. The apron area lighting was non-standard, and the amber apron lights were as bright as the runway edge lighting. When the Aero Commander turned onto final, or, at some point during the approach phase, the Aero Commander pilot inadvertently aligned his aircraft with taxiway Bravo rather than runway 08. The colour and intensity of the apron lighting combined with the similar alignment of the taxiway and runway may have contributed to the Aero Commander pilot's incorrect identification of the runway area.

FINDINGS:

Cause Related:

1. The pilot of the Aero Commander inadvertently carried out a night landing on a taxiway instead of the active runway.

2. During the landing roll, the Aero Commander collided with a Cessna which was taxiing on a portion of the taxiway designated as an airport apron area.

Other:

1. The apron area lighting was non-standard.

SAFETY ACTION:

Action Taken:

1. Transport Canada has taken action to correct the apron area lighting.

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PIPER J3C-65 CUB CF-IQY
VANKLEEK HILL, ONTARIO 2 mi W
31 JULY 1985

REPORT NUMBER: 85-O50057 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1000 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	115	35
LAST 90 DAYS	15	15

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

After approximately one hour of flight, the pilot began to feel ill and decided to make a precautionary approach and landing onto an oat field. On landing, the aircraft nose dug in, and the aircraft flipped over on its back, damaging the nose cowling and engine.

When the pilot began to feel ill and realized that he had to land, he chose what appeared to be a suitable field. However, on touchdown, the crop was much higher than the pilot had anticipated, and the aircraft nosed over onto its back. The pilot had been ill with the flu for several days prior to the accident.

FINDINGS:

Cause Related:
1. The pilot, who had suffered from the flu for several days, began feeling ill during the flight and elected to carry out a precautionary approach and landing onto a field.

2. The field chosen by the pilot was not suitable for landing.

Other:
-Nil-

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BEECHCRAFT N-35 CF-DCM
OSHAWA AIRPORT, ONTARIO
5 AUGUST 1985

REPORT NUMBER: 85-O50059 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1142 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	600	27
LAST 90 DAYS	20	14

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

During the landing roll, the aircraft nose gear collapsed, and the aircraft slid to a halt on the runway.

Because of extensive damage to the nosewheel assembly, examination of this assembly failed to reveal the cause of the collapse. Examination of the main landing gear, however, revealed that the right main gear may not have been locked down at touchdown. This could indicate that all three gear may not have reached full extension prior to landing. The pilot stated that the gear-down indicators confirmed the gear was down and locked and that the gear warning horn did not sound when the throttle was retarded. Tests conducted on the gear actuating and indicating systems revealed no malfunctions. Due to damage to the landing gear, it was not possible to check the mechanical rigging of the gear system.

FINDINGS:

Cause Related:
1. During the landing roll, the aircraft nose gear collapsed for undetermined reasons.

Other:
- Nil -

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MAULE M4-210 C-GBLM
PETERBOROUGH AIRPORT, ONTARIO
5 AUGUST 1985

REPORT NUMBER: 85-O50060 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0830 EDT
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	400	2
LAST 90 DAYS	7	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

A series of touch-and-go landings was being carried out on runway 13 in order to check out the pilot/owner on the aircraft type. During the roll-out from a landing, the aircraft began to swing to the right. The check-pilot, who was in the right seat, took control of the aircraft but was unsuccessful in preventing the aircraft from tipping up on the left wing as it swung out of control to the right.

The runway is 3,000 feet long by 100 feet wide with a well-maintained turf surface. The wind was reported to be calm at the time of the occurrence.

At a point approximately 1,900 feet from the threshold of runway 13, the aircraft began a sharp veer to the right and came to rest right-side-up, heading approximately 90 degrees to the runway heading. The centering springs on both sides of the tail wheel were detached, and the left-wheel toe-brake actuator on the check-pilot's rudder pedals was broken at the attachment point. The failure of the brake actuator rendered the left brake inoperative from the right seat of the aircraft.

It could not be determined when the tail wheel centering springs and the left brake actuator failures occurred. Failure of the springs or the brake actuator, or any combination of the two, may have contributed to the loss of directional control during the roll-out. It is possible that the springs became detached as a result of side loading on the tail wheel, as the aircraft ground looped. The brake actuator failure may have occurred as a result of heavy application of left rudder by the check-pilot when the aircraft began to swing to the right.

The brake actuator failed at the lower attachment point. When the rudder pedal is moved forward, the actuator pivots forward at the attachment point. It appeared as though a repair had been carried out on the airframe in the area where the actuator attaches to the airframe, and there was insufficient clearance for the brake actuator body to move forward without jamming on the airframe. When the jamming occurred, a prying-type load was placed on the clevis fitting located at the base of the actuator, causing the fitting to fail in overload.

FINDINGS:

Cause Related:

1. Directional control of the aircraft was lost, and the aircraft ground looped to the right.

2. The aircraft left-wheel toe-brake actuator failed, rendering the left brake inoperative from the right seat of the aircraft.

Other:

1. The pilot occupying the right seat was checking the aircraft owner out on type.

2. The pilot/owner occupying the left seat was not familiar with operating tail wheel-equipped aircraft.

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CESSNA 172M C-GIXM
ABBOTSFORD AIRPORT, BRITISH COLUMBIA
1 mi E
07 AUGUST 1985

REPORT NUMBER: 85-P50039 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1834 PDT
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,800	50
LAST 90 DAYS	100	7

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The aircraft departed Omak, Washington for a visual flight rules (VFR) flight to Abbotsford, British Columbia. The pilot contacted the Winatchee Flight Service Station (FSS) for a weather briefing; however, a complete route briefing was not available as the main computer was not serviceable. He received a briefing that covered only the portion up to the Canada-USA border. As the aircraft approached Princeton, British Columbia, there appeared to be considerable convective cloud along the Hope-Princeton Highway route, and the pilot elected to go further north along the Coquahalla Valley. This route also proved to be impassible due to weather; so the pilot returned to the Princeton area. He proceeded further north for about 30 miles toward Merrit, then to Boston Bar, and then followed the Fraser Canyon to Hope. As the aircraft approached Chilliwack, the pilot contacted the FSS at Abbotsford to advise them that he was low on fuel and to obtain approval from Canada Customs for a fuel stop at Chilliwack. When queried about his fuel state, the pilot advised that he had between 30 and 45 minutes of fuel remaining. Since the distance between Chilliwack and Abbotsford involved only about 10 minutes of flight time, the Customs Officer denied permission to land at Chilliwack and advised the pilot to proceed to Abbotsford. As the aircraft approached Abbotsford, the pilot requested and was cleared for a straight-in approach to runway 24. When the aircraft was about two miles on final, the engine started to run rough, and it stopped when the aircraft was about one-half mile from the runway. A forced landing was carried out on a cultivated field. Shortly after touchdown, the nosewheel dug into the soft soil, and the aircraft nosed over.

The aircraft had been in the inverted position for about 12 hours before it was salvaged. There was no usable fuel found in its tanks, and there was no sign of fuel leakage when the aircraft was moved. A small quantity of fuel that was drained from the fuel system appeared to be 80/87 avgas. Examination did not reveal any failure or malfunction which would have prevented the engine from running.

The pilot did not refuel prior to departure as he felt that he had adequate fuel for the journey. The detour, because of weather, added over one hour of flight time to the trip. The manufacturer recommends that the engine be operated using a lean fuel mixture setting to achieve the published fuel consumption rate. The entire flight was conducted with the fuel mixture set to the full-rich position. It is therefore likely that the aircraft's fuel was exhausted earlier than anticipated by the pilot.

The pilot felt that the Customs Officer had a great deal of power and that serious consequences would result if he did not comply with the Customs Officer's instruction. This belief influenced his decision to continue to Abbotsford even though he was concerned about the fuel state.

FINDINGS:

Cause Related:
1. The engine stopped because of fuel exhaustion, which resulted in an off-airport landing. The aircraft nosed over during the landing roll.

2. The pilot did not lean the fuel mixture as recommended by the manufacturer; as a result, fuel was exhausted earlier than anticipated by the pilot.

3. Concern about disobeying a Customs Officer influenced the pilot's decision to continue the flight.

Other:
-Nil-

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PIPER PA-32R C-GMJE
KIPLING AIRPORT, SASKATCHEWAN
10 AUGUST 1985

REPORT NUMBER: 85-C54030 (Incident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 2040 CST
OPERATION: Private Recreational
DAMAGE: Minor
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	350	55
LAST 90 DAYS	40	35

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot had completed a flight and was taxiing the aircraft to the parking area when the nose gear collapsed. The propeller, engine cowl, and some engine accessories received minor damage.

The aircraft was ferried to an overhaul facility where a broken nose gear downlock hook was replaced. The mode of failure was not determined. No other failures were discovered.

FINDINGS:

Cause Related:
1. For undetermined reasons, the nose gear downlock hook failed, and the nose gear collapsed while the aircraft was taxiing.

Other:
- Nil -

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PIPER PA-28R-200 CHEROKEE C-FYTA
FORT MCMURRAY, ALBERTA 6 mi E
10 AUGUST 1985

REPORT NUMBER: 85-W50045 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1605 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	300	10
LAST 90 DAYS	30	7

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was flying from Pine House, Manitoba to Fort McMurray, Alberta at an altitude of 10,500 feet above sea level. Twenty miles east of his destination, the pilot reduced power and descended to 6,500 feet. After levelling off, the power was increased to a cruise setting. Shortly thereafter the pilot noted a fluctuation in the engine oil pressure. This was quickly followed by an abrupt loss of engine RPM (LYCOMING IO-360-CIC), and the engine stopped. The pilot force-landed the aircraft in trees, six miles short of the runway.

The pilot had commenced his flight from Snow Lake, Manitoba but had been forced to land at Pine House, when he observed a drop in engine oil pressure and saw oil starting to cover the windscreen. On shut down, the pilot discovered that there was only one to two litres of oil remaining in the sump and that the oil was leaking from the crankshaft seal. This seal had been replaced twice in the previous year.

Several days later, the pilot, who had continued on to Fort McMurray by charter, returned to Pine House, accompanied by an Aircraft Maintenance Engineer (AME). The AME installed a new crankshaft seal and checked the oil sump for indications of contamination, but could not determine metal in the oil. After adding oil the AME did an engine run-up. The engine ran rough at high power settings, so on shut-down the AME checked and gapped the spark plugs, and carried out a pull-through compression check. The number two cylinder spark plugs were oil soaked, the compression appeared low, and the intake pipe on number three cylinder was found to be loose.

The AME then told the pilot of his concerns regarding the mechanical condition of the engine. He advised him that it would be in the pilot's best interest to leave the aircraft in Pine House until an engine change could be completed.

The pilot decided to continue the flight to Fort McMurray. He did indicate that he would check after take-off and if there was any problem he would land at Buffalo Narrows, Manitoba, where there were full facilities to do an engine change. The pilot reported that everything appeared normal, climbed to altitude and continued the flight.

After the forced landing, the aircraft was removed from the trees and taken to a hangar in Fort McMurray, where the engine was torn down and inspected.

The investigation revealed that the engine crankshaft was seized. When the crank was split, the front bearing was found to be seized to the crank; both the bearing and the crank were extremely scored, and the other two bearings were spalled. The number two cylinder was removed and it was found that the piston was burned on one side, down past the rings. Number three cylinder had two broken rings, and as noted, the intake tube was loose.

The cause of the oil leak at the crankcase seal was due to the pressurization of the crankcase, as a result of blow-by of the number two cylinder piston. The length of time the engine was running without adequate lubrication during the approach to Pine House could not be determined; however, the condition of the bearings indicate that they were damaged at that time, as substantiated by the metal slivers found in the oil.

The front main bearing was not receiving sufficient lubrication to prevent scoring and the condition ultimately resulted in the seizure of the main bearing. As a result, the engine stopped.

FINDINGS:

Cause Related:

1. The pilot, although aware of indications of a serious engine problem prior to the flight, elected to depart for his destination.

2. The number two piston was previously damaged and allowed blow-by to pressurize the engine crankcase.

3. Oil leaked by the crankshaft seal as a result of the pressurization of the crankcase.

4. The main engine bearings were damaged due to inadequate lubrication.

5. The crankshaft seized due to the damage to the front main bearing resulting in engine stoppage.

Other:
-Nil-

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CESSNA TU 206A C-FTFJ
CHILKO LAKE WILDERNESS RANCH, BRITISH COLUMBIA
10 AUGUST 1985

REPORT NUMBER: 85-P50041 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1400 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	266	94
LAST 90 DAYS	75	75

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	5

SUMMARY REPORT:

The pilot, accompanied by five passengers, departed Williams Lake on a day visual flight rules (VFR) flight to Chilko Lake. On arrival, the pilot turned the auxiliary fuel pump on and positioned the aircraft to land on runway 18. During the final approach, the pilot initiated a go-around. As he advanced the throttle, the engine (Continental TS10-520C) failed to respond. He raised the flaps, and the aircraft landed hard on the runway. The nose gear collapsed, and the aircraft ran off the runway and overturned.

On the day of the occurrence, the pilot reported that the winds were light with some turbulence in the lower levels.

Operating instructions for the Cessna TU 206A state that the auxiliary fuel pump is used for normal starting, minor vapor purging, and continued engine operation in the event of an engine-driven fuel pump failure. The instructions also note that: "If the engine-driven fuel pump is functioning and the auxiliary fuel pump switch is placed in the ON position, an excessively rich fuel/air ratio is produced unless the mixture is leaned. Therefore, this switch should be turned off during takeoff." Since the pilot had his mixture set to full rich for the approach and go-around, it was concluded the engine flooded as a result of the incorrect setting of the auxiliary fuel pump switch when the throttle was advanced.

The pilot reported that he had turned on the auxiliary fuel pump for the approach because he had once experienced an engine-driven fuel pump failure. He had intended to land but initiated a go-around when he encountered turbulence on final approach.

The aircraft's operating instructions recommend that, without power available, the aircraft be landed using 40 degrees of flap. The pilot's selection of "flaps up" after the engine lost power resulted in an increase in the rate of descent at a critical point; the pilot was unable to recover in time to avoid the hard landing.

FINDINGS:

Cause Related:

1. The pilot incorrectly selected the auxiliary fuel pump on for the approach.

2. On encountering turbulence on final approach, the pilot initiated a go-around.

3. With the auxiliary fuel pump switch on, the engine flooded as the throttle was advanced for the go-around, resulting in the engine stoppage.

4. On final approach, the pilot, for undetermined reasons, raised the flaps, which resulted in a high descent rate and a heavy landing.

Other:
-Nil-

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CESSNA A188B C-GFZE
PRINCE, SASKATCHEWAN 1 mi S
13 AUGUST 1985

REPORT NUMBER: 85-C50069 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1230 CST
OPERATION: Private Aerial Spray
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,500	700
LAST 90 DAYS	100	70

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was conducting insect spraying operations and, at the end of a pass, commenced a reverse turn over mature poplar trees. Part way through the turn, the aircraft started to sink. The pilot applied full power and jettisoned the chemical load; however, the aircraft struck the trees and crashed.

There were no reported pre-accident aircraft malfunctions, and the aircraft was apparently within weight and balance limits. At the time of the accident, the wind was from the northwest at six mph, the sky was clear, and the temperature was 18 degrees Celsius. During the previous three days, the pilot had flown about 21 hours.

It was not determined why the aircraft sank. The pilot stated that had he acted more quickly in applying power and jettisoning the load, the aircraft would not have crashed. Fatigue, resulting from the pilot's workload of the recent past, may have contributed to this accident.

FINDINGS:

Cause Related:

1. During a turn, the pilot failed to maintain obstruction clearance, and the aircraft descended into trees.

2. The pilot applied power and jettisoned the load but too late to arrest the descent.

Other:

1. The pilot had flown 21 hours during the previous three days.

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HARVARD MKIV C-GURP
POWELL RIVER AIRPORT, BRITISH COLUMBIA
22 AUGUST 1985

REPORT NUMBER: 85-P50042 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2045 PDT
OPERATION: Private Recreational
DAMAGE: Destroyed
PILOT LICENCE: Senior Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	11,100	200
LAST 90 DAYS	10	8

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	-	1	-

SUMMARY REPORT:

Prior to take-off, the pilot informed his passenger that the flight would be very short and would consist of a take-off, a stall turn, and a landing. However, after take-off, the pilot completed a number of looping and rolling manoeuvres at low altitude, culminating in an unsuccessful slow roll, 100 feet above ground level over the runway. During the roll manoeuvre, one of the wings struck a tree, and the aircraft crashed, killing the pilot and seriously injuring the passenger.

During the last manoeuvre, the nose dropped below the horizon as the aircraft rolled to an inverted attitude. When the aircraft reached 270 degrees of roll, it began to buffet before its wing caught in the trees.

The pilot carried out a number of unplanned aerobatic manoeuvres at low altitude. As well, it was determined that he had never obtained formal training or experience performing low level aerobatics.

During the latter part of the roll, the aircraft began to buffet; this would indicate that the pilot had attempted to use maximum pitch control in an effort to avoid altitude loss, while rolling through a 90-degree bank angle. However, as the aircraft's nose was below the horizon, the use of pitch controls would have aggravated the altitude loss.

Transport Canada Air Regulations do not permit the performance of aerobatic manoeuvres with a passenger on board.

FINDINGS:

Cause Related:

1. The pilot, who was not trained in low-level aerobatics, attempted a series of unplanned aerobatic manoeuvres at low altitude.

2. During a rolling manoeuvre, the correct technique was not employed to recover from the nose-low rolling attitude.

Other:

1. The performance of aerobatic manoeuvres with a passenger on board contravened Air Regulations.

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CESSNA T210L N5225V
WHITEHORSE, YUKON 6 mi W
23 AUGUST 1985

REPORT NUMBER: 85-W50904 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1315 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	600	450
LAST 90 DAYS	61	61

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	4

SUMMARY REPORT:

The pilot, with his wife and three children, departed Anchorage, Alaska on a instrument flight rules (IFR) flight to Whitehorse, Yukon, in his single-engine aircraft. Two hours after take-off, while the aircraft was cruising at 11,000 feet above sea level (asl), the engine lost power. The fuel selector was changed from the left main to the right main fuel tank, and engine power was restored. As the flight progressed, airframe icing was encountered, and the pilot climbed to FL 210.

Approximately three and one-half hours after take-off and during the descent toward Whitehorse, the engine again lost power. Reselecting fuel tanks, operating the fuel booster pump and varying the mixture did not restore engine power. During the descent, the pilot lowered the landing gear and selected 10 degrees of flap in order to reduce the time spent descending through the levels where airframe icing was expected. As a result, when the aircraft broke out beneath the cloud, 5,000 feet above the terrain, the Whitehorse Airport was visible, but was beyond gliding distance.

A narrow, winding mountain road was initially selected for the forced landing, but during the approach, the pilot chose to land in willows next to the road. After cutting a 120-foot swath through the willows, the aircraft came to rest in an upright position, and without any injuries to the occupants. A small post-crash fire, which developed in the detached right tip tank, was quickly extinguished.

Based on a fuel check completed 13 days prior to this flight, the pilot thought that he had over five hours fuel on board departing Anchorage and that the tip tanks were full. However, fuel consumption during the three and one-half hour flight would be equivalent to the fuel available from the main tanks only.

The fuel system was checked, and no damage or leaks were found. There was no usable fuel found in the main, tip, two belly header tanks or the fuel injection system. During the investigation, fuel was added, and the engine ran normally.

The engine lost power as a result of fuel exhaustion. The reason for the discrepancy between the amount of fuel on board the aircraft and the amount reported by the pilot could not be determined.

FINDINGS:

Cause Related:

1. The engine lost power a result of fuel exhaustion.

2. The pilot did not ensure that he had adequate fuel on board during his pre-flight preparation.

3. During the descent, airframe icing was encountered; so the pilot elected to partially extend the flaps and lower the landing gear, thus increasing the rate of descent while keeping the airspeed within limits. This decreased the aircraft's glide range, which might otherwise have allowed the pilot to reach the destination airport.

Other:

-Nil-

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CESSNA 310L N3298X
WATERLOO-WELLINGTON AIRPORT, ONTARIO
23 AUGUST 1985

REPORT NUMBER: 85-O50904 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1600 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	700	250
LAST 90 DAYS	30	30

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	5

SUMMARY REPORT:

During the approach, the pilot observed that the right main landing gear did not indicate down and locked. He recycled the gear but was unable to get a down-and-locked indication. After a low pass near the tower, he was informed that the gear appeared to be down, and the pilot carried out a landing on runway 25. Following a normal touchdown, the pilot applied the brakes. At this point, the right landing gear began to retract slowly, and the aircraft veered off the runway, coming to rest in a right-wing-low position on the grassy area between the runways.

Examination of the right main landing gear operating mechanism revealed that the gear had failed to reach geometric downlock. A bearing in the right landing gear actuating and locking system, specifically the uplock push-pull tube, had fused because of corrosion, thus preventing the landing gear downlock mechanism from operating properly. Lack of lubrication was the cause of the corrosion.

FINDINGS:

Cause Related:
1. Corrosion due to a lack of lubrication prevented the downlock mechanism from operating properly.

Other:

-Nil-

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BELLANCA 7ECA C-FZVH
ST. GOCHAM, ONTARIO
25 AUGUST 1985

REPORT NUMBER: 85-O50065 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1300 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	400	300
LAST 90 DAYS	Unknown	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was landing the aircraft on an unprepared lane way in a farmer's field. During the landing roll, the landing gear hit a clump of dirt, causing the aircraft to veer to the left. The left main gear became stuck in a hole off the side of the lane way, bringing the aircraft to an abrupt halt. The left gear leg collapsed, and the propeller was damaged when the aircraft nosed down.

The pilot indicated that prior to landing, he did not check the landing surface thoroughly. When the left gear became stuck in the hole, the left main gear leg U-bolt bracket failed at the mounting box, causing the gear leg to collapse.

FINDINGS:

Cause Related:
1. The pilot did not check the landing surface thoroughly to ensure that it was suitable for this type of aircraft.

2. When the left main gear became stuck in a hole, the U-bolt bracket failed and the gear leg collapsed.

Other:
-Nil -

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LUSCOMBE 8A C-GCYN
ONANOLE, MANITOBA 4 mi NE
30 AUGUST 1985

REPORT NUMBER: 85-C50074 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1000 CDT (approximately)
OPERATION: Private Other
DAMAGE: Destroyed
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	145	54
LAST 90 DAYS	1	1

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	1	-	-

HISTORY OF THE FLIGHT:

The pilot and passenger left to look for a stray bull. The aircraft was reported missing that afternoon. It was subsequently located by Search and Rescue (SAR) personnel late in the evening. Both occupants had received fatal injuries.

PERTINENT INFORMATION:

The weather was excellent. Only scattered clouds and light winds were reported at Brandon and Dauphin, which are respectively 30 miles south and north of the occurrence site.

The aircraft struck the ground in a near vertical attitude. The wreckage was confined to a small area and left a very shallow ground impression. An examination of the engine and the flight control system revealed no pre-impact failures, and the propeller was rotating at impact. The weight and balance were within the prescribed limits.

The object of the search, a stray bull, was found dead a quarter of a mile from the occurrence site.

The pilot's log book indicated 145 hours total flying time. He flew 38 hours in 1983 and 18 hours in 1984 with the last flight occurring in September. In 1985, prior to the accident, he flew 2.9 hours of which 1.9 were in the occurrence aircraft. Both the pilot's log book and the aircraft log book indicated that he had not flown in the previous three months.

The Canadian Aviation Medical Unit toxicological examination revealed that the pilot's blood-alcohol level was 167 milligrams per 100 millilitres. The RCMP Forensic Laboratory report stated that his blood-alcohol level was 160 milligrams per 100 millilitres. The passenger's blood was found to contain no alcohol. The legal limit of blood-alcohol level when driving a car is 80 milligrams per 100 millilitres.

An area resident who lives one-half mile from the accident site heard a loud bang sometime between 1000 and 1030 CDT. The aircraft was discovered by SAR personnel at 2100 CDT. The aircraft was not equipped with an emergency locator transmitter (ELT).

ANALYSIS:

The weather was suitable for the flight, and there was no evidence that the aircraft was unserviceable.

The shallow ground impression indicates that the aircraft struck the ground at low vertical speed. The low vertical speed and the high descent angle indicate that the aircraft stalled at low altitude. As the animal which was the object of search was one quarter of a mile from the occurrence site, it is possible that the pilot saw it and turned sharply to keep it in view. However, it could not be determined if this was the case.

The pilot was relatively inexperienced and did not fly regularly. He had logged 2.9 hours in the previous 12-month period, an amount that is not considered sufficient to maintain adequate currency and flying skills. Further, the alcohol in the pilot's blood could have degraded his performance; however, it cannot be stated with certainty whether flying currency or alcohol impairment contributed to the accident.

The loud bang heard between 1000 and 1030 CDT that morning is assumed to have been the aircraft crashing; however, the aircraft was not located until 2100 CDT, some 11 hours later. An ELT would have reduced the search time although this device was not required by regulation as the aircraft was being flown within 25 miles of the departure airfield. However, had the occupants not died in the crash, timely rescue would have been compromised.

FINDINGS:

Cause Related:
1. The cause of the accident could not be determined.

Other:
1. The pilot's blood-alcohol content was at a level which could have affected his ability to conduct a safe flight.

2. The pilot had flown less than three hours in the previous 12 months.

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CESSNA T210L C-FDLW
BUTTONVILLE AIRPORT, ONTARIO 1/4 mi N
31 AUGUST 1985

REPORT NUMBER: 85-O50070 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1310 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	160	18
LAST 90 DAYS	45	18

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

During the approach, the pilot could not extend the landing gear, and he decided to overshoot. The pilot left the circuit, and, after about eight minutes, he managed to extend the gear. He returned to the airport to land on runway 13.

When the aircraft was overhead the airport, the engine suddenly lost power. The pilot requested and was granted an emergency landing on runway 15, which necessitated a 180-degree turn to the left. During this turn, the pilot felt that the aircraft was losing altitude too rapidly. He discontinued the turn and landed straight ahead in a large corn field. The aircraft touched down smoothly, cut a swath 315 feet through six-foot high corn, and came to rest in an upright position. Impact with the corn stalks caused substantial damage to the horizontal stabilizer and engine cowling.

Examination of the aircraft determined that the left fuel tank was empty and that the right fuel tank contained approximately 20 U.S. gallons of fuel. Prior to landing, the pilot did not select the right-hand fuel tank, and the engine lost power because of fuel exhaustion. The evidence suggests that, while the pilot was preoccupied with the gear problem, he did not manage his fuel supply.

Further examination determined that the gear failed to extend because the gear uplock microswitch was operating intermittently.

FINDINGS:

Cause Related:
1. The gear failed to extend because of a malfunctioning nose gear uplock microswitch.

2. Mismanagement of the fuel system resulted in depletion of the fuel in the left tank and the subsequent engine stoppage.

Other:
-Nil-

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PIPER PA17 C-GFMW
CAMBRIDGE, ONTARIO 3 mi S
2 SEPTEMBER 1985

REPORT NUMBER: 85-O50067 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1210 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	250	30
LAST 90 DAYS	21	21

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	1	-

SUMMARY REPORT:

The aircraft was cruising at 1,500 feet above the ground, when the engine suddenly lost power. During the descent, the aircraft began to turn uncontrollably to the left. The pilot was unable to move the rudder pedals, and the aircraft made three complete turns, before it struck the ground heavily in a left-wing-low, nose-down attitude. The pilot and passengers were seriously injured.

During the pre-flight inspection, the pilot had drained fuel through the gascolator bowl drain cock to check for fuel contamination. At that time, he noted that there was some foreign material visible in the fuel sample.

The investigation revealed that the single fuel tank was empty and that the loss of engine power was due to fuel exhaustion. Particles of dirt and sand had become trapped in the valve seat of the drain cock when the pilot drained the sample of fuel, prior to take-off. Because of this foreign material, the valve did not seat adequately, and all the fuel in the tank drained. The aircraft's slip stream effect probably accelerated the rate of fuel loss.

While the aircraft was descending, the pilot attempted to level the wings with aileron control; however, each time this control input was made, the aircraft entered a left side-slip. Examination of the flight control system did not reveal any faults which could explain a jammed rudder or the loss of aircraft control.

FINDINGS:

Cause Related:
1. The loss of engine power was due to fuel exhaustion.

2. All fuel on board was lost when the drain cock valve failed to reseat due to contaminants in the fuel.

3. Aircraft control was lost for undetermined reasons.

Other:
- Nil -

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CESSNA A150K C-GTKM
OWEN SOUND, ONTARIO
7 SEPTEMBER 1985

REPORT NUMBER: 85-O50072 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1350 EDT
OPERATION: Private Recreational
DAMAGE: Destroyed
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	98	76
LAST 90 DAYS	9	4

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	1	-	-

SUMMARY REPORT:

The pilot, while on a flight to Sault Ste Marie, Ontario, was conducting passes at low altitude in the vicinity of a housing subdivision where an acquaintance resided. After a number of these passes, the aircraft entered a climbing left turn from a low altitude and then suddenly pitched down and rotated to the right before striking the ground. The pilot and his passenger were fatally injured, and the aircraft was destroyed by the impact and subsequent fire.

The investigation indicated that the aircraft stalled in the climbing left turn and then entered a spin to the right. There was insufficient altitude for the pilot to recover from the spin, and the aircraft struck the ground while in the incipient stage of the spin.

FINDINGS:

Cause Related:
1. During a climbing left turn from a low altitude, the aircraft stalled, spun to the right, and struck the ground.

Other:
1. The pilot flew several low passes in the vicinity of a housing subdivision where an acquaintance of the pilot resided.

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PIPER PA-28 140 CHEROKEE CF-CZI
CRYSTAL CITY-PILOT MOUND/LOUIS MUNICIPAL AIRPORT, MANITOBA
14 SEPTEMBER 1985

BRIEF NUMBER: 85-C50078 (Accident)
LOCAL TIME: 1940 CDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	61	60
LAST 90 DAYS	4	4

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

REPORTED CIRCUMSTANCES:

The pilot, with two passengers on board, was concluding a 20-minute local flight. He approached to land on the only available runway, which was turf covered, oriented east/west, and 2,600 feet long by 75 feet wide. The wind sock was of limited value, due to a deterioration in its length to approximately 18 inches. The aircraft drifted left and touched down with only the right main wheel on the runway. The nosewheel was just off the runway in soft ground, and the left main wheel was in long grass. The aircraft veered off the runway and slowly nosed over.

Thirty minutes prior to the accident, a weather observation taken three miles from the accident site recorded a south-southeast wind at 10 knots. The pilot assessed the wind as stronger and gusty.

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PIPER PA-28-180 CHEROKEE C-GXGN
STE. ROSE DU LAC, MANITOBA
18 SEPTEMBER 1985

BRIEF NUMBER: 85-C50079 (Accident)
LOCAL TIME: 0846 CDT
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	106	19
LAST 90 DAYS	38	19

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

The pilot was landing on a 2,100-foot wet, rutted grass strip which was fenced at one end and obstructed by a power line at the other. A corral was located 40 feet from the runway centre line near the upwind end. The approach speed was higher than normal.

During the landing roll-out, the aircraft swung to the left, and the pilot was unable to effect corrective action. The aircraft struck the corral, damaging the left wing and propeller.

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PIPER PA28-151 C-GDYA
FORT MCMURRAY, ALBERTA 19 mi N
20 SEPTEMBER 1985

REPORT NUMBER: 85-W50050 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2115 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	477	37
LAST 90 DAYS	30	30

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	1	-

HISTORY OF THE FLIGHT:

The aircraft departed Fort McMurray on a visual flight rules (VFR) flight to Fort Chipewyan at 2054 mountain daylight time (MDT). Shortly after take-off, and when clear of the control zone, deteriorating weather conditions were encountered. A turn was made to return to the departure airport. During the turn, the pilot heard a loud cracking noise, and the aircraft began to vibrate. The pilot applied power and attempted to climb, but the vibration was so severe that he reduced power and carried out a forced landing.

The emergency locator transmitter (ELT) was located at 0200 MDT, but adverse weather prevented a rescue of the seriously injured occupants until the next morning. Although shoulder harnesses were installed in the aircraft, they were not worn by the occupants.

PERTINENT INFORMATION:

The weather at Fort McMurray at the time of take-off was reported as a broken to overcast ceiling at 2,300 feet above ground level (agl) with a visibility of 10 miles in light rain. The forecast for the area called for frequent light rain with patches of low cloud forming at 1,500 to 2,500 hundred feet above ground. Visibilities were predicted to be occasionally as low as three miles in rain and fog.

Investigation at the scene revealed that, during the turn, the aircraft struck a tree and that the damage from this impact caused the aircraft to vibrate. The aircraft was then force-landed into the trees in a wings-level, nose-down attitude. The unsecured cargo, which was in the rear of the cabin, flew forward during crash deceleration. There were no aircraft documents carried in this flight, and there was an unapproved radio installation on the aircraft.

Although not a factor in the accident, the fuel used in the aircraft was of the automotive type.

ANALYSIS:

Although there was no record at the Fort McMurray weather office that the pilot had checked the conditions prior to this flight, he stated that he had telephoned the office a couple of times during the day for weather information. He knew the conditions were not the best, but the weather was forecast to be suitable for VFR flight, and he elected to do the flight. Conditions such as those forecast, particularly at night, would result in a limited horizon for maintaining VFR flight. To maintain VFR, the pilot would have had to have flown below the lowest cloud layer which would have been less than 500 feet agl over the terrain to the north of the airport. During the turn to remain VFR, the pilot inadvertently allowed the aircraft to descend, which resulted in the initial tree strike.

The following laboratory report was completed:
LP 222/85 - Fuel Sample Analysis.

FINDINGS:

Cause Related:
1. When the pilot attempted a turn away from deteriorating weather, he allowed the aircraft to descend until it struck a tree.

2. The initial tree strike caused a severe aircraft vibration, and the pilot was forced to land the aircraft into the trees.

Other:
1. The required documents were not carried on this flight.

2. There were modifications to the aircraft which were not approved or recorded in the log book.

3. The aircraft was fuelled with automotive fuel.

4. The shoulder harnesses installed in the aircraft were not used by either occupant.

5. Cargo carried on board the aircraft was not secured.

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CESSNA 182P C-GJVA
REDVERS, SASKATCHEWAN
25 SEPTEMBER 1985

REPORT NUMBER: 85-C50082 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1925 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	157	62
LAST 90 DAYS	35	35

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

On arrival at the destination aerodrome, the pilot descended to 500 feet above ground level (agl) and overflew the 2000-foot turf runway twice to determine the runway condition and wind direction. He then carried out a soft-field landing on runway 33, using 40 degrees of flap. After the nosewheel touched down, it dug into the turf and the nosewheel assembly collapsed.

The accident occurred at dusk. The runway surface was soft, rough and covered with fairly long grass. The area had received heavy rain during the previous week.

The pilot had not attempted to obtain a runway condition report before the flight, and it is difficult to visually assess the "softness" of a runway, especially in near darkness. As the nosewheel dug into the soft turf, the forces on the strut caused it to fail.

FINDINGS:

Cause Related:
1. The pilot did not determine the condition of the runway prior to landing.

2. The nose gear failed during landing as the nosewheel dug into the soft runway.

Other:
-Nil-

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PIPER PA-12 C-FYQP
FRASER LAKE, BRITISH COLUMBIA 1.5 mi E
05 OCTOBER 1985

REPORT NUMBER: 85-P50044 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1707 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	300	60
LAST 90 DAYS	6	6

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot was refuelling the aircraft on a slight slope at the end of the 1,800-foot airstrip. Prior to refuelling, he placed both fuel selectors to the OFF position to prevent fuel from transferring between the aircraft fuel tanks. When the tanks were full, he started the engine and took off with the selectors still in the OFF position. At approximately 50 feet above ground, the engine stopped, and the pilot force-landed on an adjacent railway line.

The standard Piper PA-12 fuel system consists of two fuel tanks, one located in each wing. The left tank is the main tank, and the right tank is the auxiliary. Fuel from the tanks flows by gravity feed to the engine. Two selectors, one marked LEFT TANK MAIN, the other RIGHT TANK AUX, are located on the left side of the cockpit. These selectors have two positions, one marked ON, the other OFF. The fuel panel normally includes a warning that the main fuel valve should be on at all times. C-FYQP was equipped with the standard fuel system as outlined above; however, the fuel panel was different in that it did not contain this warning, nor did it identify the tanks as main and auxiliary.

The pilot's handbook contains only limited information about the fuel system. However, it does state that the main tank fuel selector should be on at all times and the auxiliary tank should be turned off to prevent fuel from transferring between the tanks during refuelling operations. It also contains a starting check-list, the first item of which is, "Left Tank, Main Fuel Valve ON".

The pilot had a copy of this manual; however, he did not make use of the check-list. The pilot did not normally turn the fuel selectors off while refuelling. On this occasion he did so, as the aircraft was on a slope, and fuel transfer between the tanks may have occurred.

The investigation determined that the fuel valve selection to the OFF position prior to take-off caused the engine to stop as a result of fuel starvation. Had the pilot been more familiar with the fuel system, he could have prevented fuel transfer during refuelling by turning off only the right tank. Had the fuel panel been adequately placarded and had the pilot used the engine starting check-list, flight with both fuel valves selected OFF could have been avoided. The omission of the fuel panel warning was probably the result of interior modifications that had been completed on the aircraft during previous cockpit modifications.

FINDINGS:

Cause-Related:

1. The pilot was not familiar with the fuel system and did not follow the refuelling procedures outlined in the pilot's handbook.

2. The pilot placed both fuel selectors to the OFF position during refuelling and did not turn them on again prior to take-off; as a result the engine stopped due to fuel starvation.

Other:

1. The appropriate warning that could have reminded the pilot to select the valves to the ON position was missing from the fuel panel.

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PIPER PA-34-200T SENECA N3423M
CARLSBAD SPRINGS, ONTARIO 1 mi NE
08 OCTOBER 1985

REPORT NUMBER: 85-O50905 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1311 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,325	225
LAST 90 DAYS	30	30

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

The aircraft was at 4,500 feet above sea level on a visual flight rules (VFR) flight from Mirabel to Ottawa. While being radar vectored for the approach, there was a power loss on the right engine followed by a power loss on the left engine. A complete electrical failure occurred a short time later. The landing gear was extended manually, and a forced landing was carried out in a swampy area.

Prior to departing Mirabel, the pilot started the right engine but was unable to start the left engine. As a result, the battery was completely discharged. The spark plugs were cleaned, reinstalled, and then both engines were started using external power. A run-up was carried out, and the alternators were checked. The engines were shut down and restarted using the aircraft's battery.

When the pilot was trying to start the left engine, it was suggested to him to cross-feed warmer fuel from the right tank to the left engine to aid in starting the left engine. The pilot selected the right fuel selector rather than the left fuel selector to the cross-feed position, and, as a result, both engines were feeding from the left tank.

Following the occurrence, an examination of the fuel tanks revealed that the left tank was empty, and the right tank contained approximately 30 gallons. In addition, it was determined that the fuel injection systems on both engines were empty of fuel and that the engines stopped because of fuel exhaustion. The pilot had left the fuel selector for the right engine in the cross-feed position even though the first item on the take-off check-list was "Fuel selectors on". Following the loss of power to both engines, the pilot selected the right fuel selector to ON which should have supplied fuel to the right engine. However, the fuel did not get to the engine because there was not time for the engine driven pump to clear the air from the fuel system. Because of the electrical failure, the electric fuel pump was not operating.

When both engines stopped, the battery became discharged very quickly. It is unlikely that the battery was able to be recharged to full capacity since it had been drained to near zero charge on the ground in Mirabel.

FINDINGS:

Cause Related:

1. During the start of the left engine, the pilot selected the right fuel selector to the cross-feed position; as a result, both engines were feeding from the left fuel tank.

2. The pilot did not complete the take-off check-list with respect to fuel management.

3. The engines stopped because of fuel exhaustion.

Other:

1. The reason for the electrical failure could not be determined with certainty, but it is possible that it was caused by excessive drain on a slightly charged battery.

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STINSON 108-2 C-FOVM
ST. ANDREWS, MANITOBA 5 mi N
09 OCTOBER 1985

REPORT NUMBER: 85-C50086 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1035 CDT
OPERATION: Private Ferry
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4,200	60
LAST 90 DAYS	20	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was taking off from a 2,500-foot grass strip covered with about three inches of loose snow. The aircraft was not airborne by the end of the strip, and the pilot elected to continue the take-off run over a field. The aircraft nosed over about 50 feet beyond the end of the runway.

Snow had been cleaned off the aircraft prior to the attempted take-off, and the engine had been warmed up and was operating normally. The aircraft weight and balance were within limits, and the weather was not a factor in the accident; the wind was very light. The field off the end of the runway was soft and muddy.

The aircraft did not accelerate to take-off speed because the snow on the runway created drag. In addition, the surface of the field was too soft to support the weight of the aircraft. The aircraft nosed over when the wheels dug into the ground.

FINDINGS:

Cause Related:

1. The pilot attempted to take off from an unsuitable area.

2. Snow on the strip prevented the aircraft from accelerating to take-off speed.

3. The pilot elected to continue the take-off on an unprepared surface, and the aircraft nosed over.

Other:

- Nil -

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AERO COMMANDER 100-180 C-GGCR
BARRIE AIRPORT, ONTARIO
12 OCTOBER 1985

REPORT NUMBER: 85-O50082 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1210 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	110	30
LAST 90 DAYS	25	25

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was returning to Barrie after a local visual flight rules (VFR) flight. There was a strong crosswind from the right, and during the approach, the pilot selected full flap and maintained a slightly higher than normal airspeed. Upon landing, the aircraft bounced and then settled onto the runway. When the pilot turned off the runway, the nosewheel collapsed.

It was determined that because the approach was made with full flap and at a higher than normal speed, the aircraft touched down nosewheel first. When the aircraft turned off the runway, the nose gear, which may have been damaged during the landing, collapsed. Metallurgical examination of the failed component was not carried out.

FINDINGS:

Cause Related:
1. The approach was made with full flap, at a higher than normal speed which resulted in the aircraft touching down nosewheel first.

Other:
- Nil-

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BEECH B19 C-GXNP
MELBOURNE, ONTARIO
13 OCTOBER 1985

REPORT NUMBER: 85-O50080 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1205 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	130	40
LAST 90 DAYS	20	20

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was planning to land at a private airstrip, pick up a passenger, and continue on to his destination. After touching down long, the pilot decided to carry out a go-around, and he applied full power. The right wing struck a tree off the end of the runway, and the aircraft came to rest sideways in a corn field.

The investigation revealed that the pilot had landed with a nine-knot tail wind, resulting in the aircraft landing long. Because the pilot felt he could not stop the aircraft in the remaining distance available, he attempted to go around. However, there was not sufficient distance available to enable the aircraft to clear the obstacles in its flight path.

FINDINGS:

Cause Related:
1. The landing was attempted downwind, and the touchdown was made well down the runway.

2. The pilot attempted to go around with insufficient distance available to enable the aircraft to clear the obstacles at the end of the runway.

Other:
- Nil -

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GLOBE GC-1B CF-ZQZ
MELITA, MANITOBA 11 mi N
14 OCTOBER 1985

REPORT NUMBER: 85-C50088 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1620 CDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,500	Unknown
LAST 90 DAYS	Unknown	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	-	-	-

HISTORY OF THE FLIGHT:

The pilot was on a cross-country recreational flight and had departed Virden, Manitoba following a refuelling stop. About 20 minutes after departing Virden, the aircraft was observed manoeuvring at low level as though the pilot was attempting to land. As the aircraft approached some farm buildings, it turned toward an open field and crossed a highway and a power line. Over the power line, the aircraft was seen to bank abruptly, descend in a slight nose-down attitude, and strike the ground. The aircraft bounced once and came to rest in an upright position, 60 feet beyond the point of initial impact. The pilot was fatally injured.

PERTINENT INFORMATION:

Witnesses stated that the aircraft's engine was "missing" or "surging" when they first observed the aircraft. The investigation found that the aircraft's plunger-type fuel primer was about two-thirds of the way open and that the locking pin, which normally held the primer closed, had broken away. Several ear plugs were hanging from the primer. The engine's spark plugs and magnetos were serviceable. The carburettor was too severely damaged for investigators to assess its pre-impact condition. The aircraft contained a sufficient quantity of the correct grade fuel for the proposed flight.

The wind was from the west at 15 to 20 knots, and the aircraft was heading in an easterly direction when it crossed the power line.

The aircraft's emergency locator transmitter (ELT) had been removed sometime prior to the flight. The Condition and Conformity Inspection (CCI) had not been carried out, and, as a result, the aircraft's Certificate of Airworthiness (C of A) had lapsed the day prior to the flight.

The pilot had not renewed his medical, and, as a result, his pilot licence was not valid as of 21 September 1984.

ANALYSIS:

The open primer and the witness observations indicate that the engine was losing power and that the pilot was attempting a forced landing. The primer had opened in flight because of the failed locking pin. Unmetered fuel would have been introduced to the engine causing a too rich fuel/air mixture which would have resulted in the loss of engine power. The pilot may not have noticed the open primer because of the ear plugs hanging on it.

The abrupt banking manoeuvre observed by the witnesses and the lack of wreckage scatter are characteristic of an in-flight stall and loss of control. The pilot allowed the aircraft's airspeed to decay as he overflew the power line, and the aircraft stalled at such a low altitude that he could not effect a recovery. The evidence suggests that either he allowed the airspeed to decay while stretching his glide to clear the power line or he misjudged his airspeed because of the strong tail wind.

FINDINGS:

Cause Related:

1. The engine lost power because a failed primer locking pin allowed the primer to open, causing a too rich fuel/air mixture to be introduced to the engine.

2. During a forced landing attempt, the aircraft stalled at such a low altitude that the pilot could not effect a recovery.

Other:

1. The ELT was removed from the aircraft sometime prior to the flight.

2. The aircraft's C of A had lapsed the day prior to the flight.

3. The pilot's licence was not valid.

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PIPER PA-23-250 N700KC
HASKETT, MANITOBA
14 OCTOBER 1985

REPORT NUMBER: 85-C50901 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1215 CDT
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Airline Transport (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	6,010	2,400
LAST 90 DAYS	120	120

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot landed his aircraft after a flight from Windom, Minnesota. Touchdown was normal; however, as the aircraft was rolling down the runway, the nose gear folded rearward, and the aircraft slid several hundred feet on the aircraft nose and main wheels.

The pilot stated that he intended to retract the flaps during the landing roll; however, he inadvertently selected the gear up. Because of the aircraft speed, there was insufficient weight on the left main landing gear to compress the anti-retraction valve and prevent gear retraction.

FINDINGS:

Cause Related:
1. During the landing roll, the pilot selected the gear up when he intended to retract the flaps.

2. Extension of the left oleo prevented the operation of the anti-retraction valve.

Other:
- Nil -

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PIPER PA-22-135 CF-RFT
MIDLAND, ONTARIO 10 mi SE
17 OCTOBER 1985

REPORT NUMBER: 85-O50084 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1615 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	139	49
LAST 90 DAYS	12	12

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was landing the aircraft on a private airstrip. He reported that, shortly after touchdown, a gust of wind lifted the aircraft away from the runway, and he decided to go around to attempt another landing. The pilot applied full throttle abruptly and experienced a lag in power response. He rejected the go-around attempt, when he assumed the aircraft would not clear the trees beyond the airstrip, and landed the aircraft on the remaining runway. The aircraft overran the runway and came to a stop in rough terrain and water.

The weather conditions were clear skies with crosswinds gusting between 10 to 15 knots.

The pilot reported that the combination of the slow engine response to throttle movement and the proximity of trees at the end of the airstrip contributed to his decision to land the aircraft on the remaining runway.

The abrupt application of power resulted in the lag in power response. Once the pilot rejected the go-around, there was insufficient runway length remaining on which to stop the aircraft.

FINDINGS:

Cause Related:
1. The pilot decided to go-around after landing in gusting cross-wind conditions.

2. The pilot applied power too quickly, and the engine power lagged.

3. The pilot elected to reject the go-around because of the power lag and the presence of trees beyond the end of the airstrip.

4. There was insufficient runway length remaining on which to stop the aircraft, and it was damaged when it overran the runway and struck rough terrain.

Other:
-Nil-

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RISK OF COLLISION BETWEEN PZL-104 WILGA 80 C-GCVP and SDZ 50-3 PUCHACZ C-GHGW OMEMEE, ONTARIO 1 mi N 19 OCTOBER 1985

LOCAL TIME: 1830 EST
INFORMATION SOURCE: Field Investigation

PZL-104 WILGA 80 C-GCVP
REPORT NUMBER: 85-O50085 (Accident)
OPERATOR Kawartha Soaring Club Inc.
OPERATION: Flying Club Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	816	100
LAST 90 DAYS	12	12

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SDZ 50-3 PUCHACZ C-GHGW
REPORT NUMBER: 85-O50085 (Accident)
OPERATOR: Kawartha Flying Club Inc.
OPERATION: Flying Club Recreational
DAMAGE: Nil
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	8,080	Unknown
LAST 90 DAYS	Unknown	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The aircraft was operating out of a grass field, towing a Puchacz, two-place glider. Shortly after take-off, the engine (CNPSLPZL KALISZ) lost power, forcing the pilot to release the glider and force-land in a field. The glider, with two souls on board, landed safely. The Wilga sustained substantial damage.

The pilot heard an "intermittent spitting sound" from the engine shortly after take-off and noted an engine power loss. He attempted to gain speed by lowering the nose to enable the aircraft to tow the glider safely over hydro wires bordering the road at the end of the runway. Having done this, the pilot released the glider. A passenger in the glider said the altimeter read 150 feet when they were released. The Wilga pilot, unable to maintain altitude with the power available, turned to the north and prepared to land in the field. Suspecting that the aircraft may be low on fuel, he switched fuel tanks but there was no change. When he looked down, he saw the glider below him.

Realizing the two aircraft would collide if he continued on that heading, the Wilga pilot turned farther to the northeast and pulled the nose up to gain altitude. By that time, the airspeed had deteriorated, and the aircraft continued a rapid descent to the ground.

Examination of the aircraft's engine revealed no obvious defects that could have contributed to the loss of power. When the spark plugs were examined, they were found to have deposits of carbon, giving them a gritty, black appearance. Soot was also found in the exhaust. These are both signs of too rich a fuel/air mixture, a condition that can be caused by carburettor icing. The weather report for Toronto, the closest reporting station at the time, indicated that the temperature was 14 degrees Celsius and the dew point 8 degrees Celsius. A Carburettor Icing Chart indicates that, at this temperature and dew point, "moderate icing - cruise power", or "serious icing - any power" may be experienced. The aircraft's flight manual check-list requires that the carburettor heat be checked as functional during engine run-up, but only that it be checked 'off' before take-off.

The pilot stated that he did a full engine run-up prior to his first flight. However, the carburettor heat may not have been used after that initial check. The descent check and the before-landing check require that the carburettor heat be adjusted, as necessary.

The demanding nature of glider towing can be very hard on an aircraft engine. The aircraft is required to take off, climb to altitude, release the glider, and then decelerate quickly to land. During descent, it is sometimes necessary to reduce the power to idle. The aircraft then may sit on the ground, idling, while waiting for the glider to land and again be hooked up for the tow. These procedures would increase the likelihood of carburettor icing.

Although conditions were conducive to the formation of carburettor ice, and there was evidence that carburettor ice may have been present, it was not possible to prove its existence. Therefore, the cause of the engine power loss is undetermined.

The following laboratory report was completed:
LP 255/85 - Analysis of Liquid Sample - Wilga 80, C-GCVP.

FINDINGS:

Cause Related:

1. The engine lost power for undetermined reasons.

2. The aircraft speed deteriorated as the pilot manoeuvred to avoid the glider, which resulted in a right-wing-low, hard landing.

Other:

-Nil-

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CESSNA 180J SKYWAGON C-FAWL
BUCKINGHORSE CREEK, BRITISH COLUMBIA
21 OCTOBER 1985

BRIEF NUMBER: 85-W50060 (Accident)
LOCAL TIME: 1430 PST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,000	N/A
LAST 90 DAYS	N/A	N/A

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

REPORTED CIRCUMSTANCES:

The pilot, with one passenger on board, diverted to an alternate airstrip because of deteriorating en route weather. The snow covered airstrip appeared suitable, but on touchdown the left main wheel struck a low ridge of hard-packed snow, and the left undercarriage leg folded outward. The hard-packed ridge of snow was not visible from the air.

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CESSNA 182F C-FOZY
STONEY CREEK, ONTARIO
27 OCTOBER 1985

REPORT NUMBER: 85-O50088 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1630 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	495	325
LAST 90 DAYS	27	27

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot aligned the aircraft for a straight-in visual approach at a private aerodrome where he based his aircraft. The pilot selected partial flap, and, on final, the aircraft's airspeed and altitude were high. The aircraft touched down approximately two-thirds down the wet turf airstrip, overran the end of the runway, and struck a ditch, causing the nose gear to collapse.

The investigation revealed that, as the altitude and airspeed were too high on final approach, the aircraft was landed long. Because of the wet condition of the runway and the high touchdown speed, the pilot was unable to stop the aircraft in the distance remaining.

FINDINGS:

Cause Related:

1. The aircraft was too high and too fast on the final approach, resulting in the aircraft landing long.

2. The braking action was ineffective on the wet turf runway.

3. The aircraft struck obstructions off the end of the runway, causing the nose gear to collapse.

Other:

- Nil -

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CHAMPION 7ECA C-FRXH
PORT MOODY, BRITISH COLUMBIA
30 OCTOBER 1985

REPORT NUMBER: 85-P50049 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1705 PST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,900	300
LAST 90 DAYS	90	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	1	-

SUMMARY REPORT:

The pilot departed Pitt Meadows Airport for a local flight to demonstrate the aircraft to a prospective buyer. The aircraft was observed over Burrard Inlet, adjacent to Port Moody. Witnesses, who included a championship aerobatic pilot, saw the aircraft complete a series of lazy eights, followed by a flick roll. The aircraft completed two and one-half revolutions, during which it entered a near vertical dive. During the recovery, the aircraft struck the water and started to sink. The occupants exited the sinking aircraft and were picked up by a work boat.

The pilot carried out a series of aerobatic manoeuvres. The rolling manoeuvre was initiated at an altitude that was insufficient to effect a recovery.

FINDINGS:

Cause Related:
1. Aerobatic manoeuvres were attempted without sufficient altitude for a safe recovery.

Other:
1. Contrary to the Air Regulations, the pilot conducted a series of aerobatic manoeuvres while carrying a passenger on board.

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CESSNA 210L C-GOUR
MOOSONEE, ONTARIO
13 NOVEMBER 1985

REPORT NUMBER: 85-O50089 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1356 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,182	136
LAST 90 DAYS	37	19

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The aircraft landed at Moosonee, Ontario with the landing gear up.

The pilot did not complete a pre-landing check, and he did not select the gear down. The aircraft is equipped with a gear warning horn, but it did not sound. Normally the gear warning horn will sound when the gear is not down and the throttle is reduced below 12 inches of manifold pressure (MAP). It is possible that the horn did not activate because the landing was accomplished without reducing the MAP to the horn-activation threshold.

FINDINGS:

Cause Related:
1. The pilot did not carry out a pre-landing check and did not lower the landing gear.

Other:
- Nil -

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PIPER PA-28-140 C-GYVQ
GRENFELL, SASKATCHEWAN 10 mi N
14 NOVEMBER 1985

REPORT NUMBER: 85-C50093 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1200 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	187	25
LAST 90 DAYS	6	6

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

HISTORY OF THE FLIGHT:

The pilot was conducting a take-off from his private farm strip for a short visual flight rules (VFR) flight to Dubuc, Saskatchewan. After a longer than normal take-off roll, the aircraft became airborne but would not climb. The pilot felt that the engine was not producing normal power. He turned to avoid obstacles ahead and lowered the nose to gain airspeed. The aircraft touched down and bounced back into the air. The pilot then started a turn to avoid several trees that stood in the aircraft's path. Before this could be accomplished, the left wing struck the trees, and the aircraft travelled about 170 feet before it crashed in an open field.

The seriously injured pilot was found approximately one and one-half hours later.

PERTINENT INFORMATION:

The pilot, after preparing for the flight, started the aircraft and left the engine running at idle while he went to have lunch. He estimated that this took about 20 minutes.

The pilot noted that there was a light layer of hoar frost on the aircraft at start-up. When he returned to the aircraft after lunch, the frost had cleared from the wings near the roots, but some still remained on the outer wing surfaces. He did not remove the remaining frost before carrying out an engine run-up and proceeding with the take-off.

An on-site investigation revealed that the spark-plugs were fouled.

ANALYSIS:

Two factors contributed to this accident. First, the aircraft wing, contaminated by hoar frost, produced less lift than normal. Second, an extended period of engine idling produced fouled engine spark-plugs which reduced engine performance.

Despite an abnormally long take-off roll and normal rotation speed, the aircraft would not climb or accelerate once airborne. The pilot was unsuccessful in an attempt to manoeuvre the aircraft and avoid obstacles beyond the runway, and the aircraft crashed after the left wing struck trees.

FINDINGS:

Cause Related:

1. A prolonged period of engine idling caused fouling of the spark-plugs, which prevented the engine from producing maximum power.

2. The pilot attempted the take-off with hoar frost on the wings of the aircraft.

3. Once airborne, the aircraft's reduced performance prevented the pilot from manoeuvring to avoid obstacles.

Other:
-Nil-

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GRUMMAN G1159 GULFSTREAM II N104AR
EDMONTON INTERNATIONAL AIRPORT, ALBERTA
24 NOVEMBER 1985

REPORT NUMBER: 85-W50906 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2114 MST
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS	PILOT-IN-COMMAND		CO-PILOT	
	ALL TYPES	ON TYPE	ALL TYPES	ON TYPE
TOTAL	5,300	1,000	4,200	700
LAST 90 DAYS	125	90	125	90

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	3
PASSENGERS	-	-	3

SUMMARY REPORT:

On final approach to Edmonton Municipal Airport, the indicator light for the right main gear showed unsafe when the landing gear was lowered. The pilot discontinued the approach and was directed to Edmonton International Airport. He circled the airport until 1,000 pounds of fuel remained on board. While circling, the landing gear was cycled four times, after which both main gear lights remained unsafe. The emergency lowering system was activated but was unsuccessful. Shortly after touchdown, the right main gear collapsed, and the aircraft veered to the right, off the runway.

Investigation at the scene failed to determine the cause of the gear's collapsing, but it was determined that the right main gear side brace (hydraulic actuator) was not in the locked position. Until the main gear side braces are fully extended, the unsafe gear light remains on. It is believed that the left side brace locked in the down position, during the landing roll.

The side braces were removed and examined at the manufacturer's facility. During the test of the right side brace, pressure higher than that normally supplied by the aircraft hydraulic system was required to operate the side brace. The emergency landing gear extension operated normally, but the additional pressure required to lower the landing gear caused the emergency system to be ineffective. A set of new gland seals was installed, and the side brace tested satisfactorily under normal operating pressures. No defects were found in the side brace gland seals that were removed. It could not be determined why above normal pressure was required to operate the side brace.

The following laboratory report was completed
LP 8/86 - Examination of Side Brace Seals.

FINDINGS:

Cause Related:
1. During the landing, the right main gear side brace did not fully extend and lock, and the gear collapsed.

2. For undetermined reasons, above normal hydraulic pressure was required to operate the right main gear side brace.

Other:
-Nil-

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BEECH C24R C-GCFW
BRANTFORD, ONTARIO
25 NOVEMBER 1985

REPORT NUMBER: 85-O50091 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1115 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,500	400
LAST 90 DAYS	20	20

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The pilot selected gear down and noted three green lights as a gear down indication. The gear down indication was confirmed on both the downwind leg and the final approach to the runway. On the landing roll, the nose gear collapsed, and the aircraft skidded down the runway on its nose.

Wear at the attachment points of the nose gear down limit microswitch bracket made it possible to obtain a nose gear down indication without the nose gear being in the fully down-and-locked position. It was also noted that one of the wires in the wire bundle to the nose gear down limit microswitch had failed in bending fatigue. This wire was identified as G29A18. The wire bundle had been rubbing on the engine mount, causing the wire to bend every time the landing gear was cycled.

Beech Aircraft Company had issued a Class I Service Instruction, No. 1032, dealing with the routing of the wire bundle from the microswitch. The Service Instruction specifies that the microswitch be installed so that the wire bundle is routed away from the engine mount. The aircraft technical log indicated that this Service Instruction had been complied with on 20 December 1982.

The wire, G29A18, electrically connects the landing gear motor actuating solenoid and the landing gear warning horn to the nose gear down limit microswitch. When the wire broke, electrical power was removed from the landing gear motor actuating solenoid before the nose gear was completely down and locked. Since the nose gear extends into the air flow, it is normally the last of the three gear to lock down. The wear on the microswitch bracket made it possible to obtain the down indication when the gear was in an unsafe condition. Since the wire that broke normally supplies electrical power to the landing gear warning horn, the pilot had no warning of the unsafe condition.

FINDINGS:

Cause Related:

1. The nose gear down limit microswitch was not installed in the approved manner as outlined in Service Instruction, No. 1032.

2. The wire bundle from the down limit microswitch rubbed on the engine mount each time the landing gear was cycled.

3. The wire identified as G29A18 failed, prematurely removing power from both the landing gear motor actuating solenoid and the landing gear warning horn.

4. Wear on the down limit microswitch bracket made it possible to obtain a safe-down indication for the nose gear when that gear was not fully down and locked.

5. The nose gear collapsed on landing because it was not down and locked.

Other:

- Nil -

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CESSNA 170B C-FTDQ
COMOX, BRITISH COLUMBIA 20 mi ESE
26 NOVEMBER 1985

REPORT NUMBER: 85-P50052 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1749 PST
OPERATION: Private Recreational
DAMAGE: Missing
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	672	219
LAST 90 DAYS	45	14

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS:	-	-	-

SUMMARY REPORT:

In preparation for a flight from Campbell River, British Columbia, via Comox to Vancouver, the pilot received a weather briefing in which he was advised that, en route he could expect low ceilings and visibility of less than two miles. He filed a visual flight rules (VFR) flight plan and departed at night at 1631 Pacific standard time (PST). Prior to being cleared through the Comox air traffic control zone, the controller cautioned the pilot about the en route weather and asked him if he intended to continue the flight. The pilot advised the controller that he would turn back if the weather became unsuitable. Twenty-five minutes later, the pilot called Comox and requested navigational assistance as he was out of sight of land. Comox radar was unable to locate the aircraft; however, when the pilot, who had previously held an instrument rating, climbed to 4,000 feet above sea level (asl), the aircraft was positively identified 40 miles east of the estimated position. The Comox radar controller attempted, unsuccessfully, for forty-five minutes to vector the pilot back toward Comox.

The pilot reported that the vacuum system had iced up and that the airspeed indicator, directional gyro, and artificial horizon were not functioning and that his altitude was varying between 200 - and 5,600 - foot asl extremes.

Following a report from the pilot that he had sighted a lighthouse from 1,500 feet, radar contact was lost 22 miles east of Comox. An extensive search was carried out the next day; however, neither the pilot nor any wreckage was found.

An unstable air mass with embedded towering cumulus cloud formations was influencing the en route weather at the time of the flight. The forecast called for overcast ceilings of 500 to 1,000 feet asl with visibility varying between one and three miles in snow showers. The freezing level was on the surface.

Except for the turn and bank indicator, which was electrically driven, the other flight instruments were operated by vacuum and pitot static systems. The pitot static system was not electrically heated.

The evidence suggests that, during the flight, while the aircraft was in cloud, ice built up on the pitot tube and venturi of the pitot static and vacuum systems respectively, rendering all related flight instruments unreliable. The pilot's difficulty in following the radar controller's heading direction and his inability to maintain a level attitude is considered, for the most part, to have been a direct result of the icing which disabled all but one of his flight instruments. The pilot's difficulty in maintaining controlled flight in cloud was probably aggravated by his lack of flying proficiency in instrument meteorological conditions. When the pilot sighted the lighthouse, it would have been very difficult for him to keep this single point of light in view without experiencing disorientation, particularly as he had almost no reliable flight instrumentation and no visual horizon.

FINDINGS:

Cause Related:
1. The pilot initiated flight into adverse weather, which was inappropriate for the aircraft's limited equipment.

2. The pilot was unable to maintain adequate control of the aircraft when flight instrumentation on board was adversely affected by the formation of ice on the pitot static and vacuum systems.

Other:
-Nil-

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PIPER PA-22-150 C-GWJB
KUSAWA LAKE, YUKON TERRITORY
30 NOVEMBER 1985

REPORT NUMBER: 85-W50067 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1400 YST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	245	125
LAST 90 DAYS	27	27

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

Prior to landing on the ice-covered lake, the pilot of the wheel-equipped aircraft completed several touch-and-go landings, in order to check the firmness of the ice. On the final landing roll, the pilot switched off the engine. Just as the aircraft came to a stop, the nose gear broke through the ice, and the aircraft started to settle in the water. The wings and horizontal stabilizer came to rest on the ice and prevented the aircraft from sinking completely. The pilot and his passenger exited from the partially submerged aircraft and made their way to a cabin, where they remained until they were found and picked up by Search and Rescue the following day.

A small stream entered the lake close to the area where the aircraft came to a stop. Generally, the thickness of the ice on the lake was four inches, enough to support the weight of the aircraft. However, the thickness of the ice had been reduced to approximately two inches by the action of the stream.

The weakened ice would not support the weight of the aircraft as it slowed down and stopped, and, as a result, the aircraft broke through the ice and settled in the water.

FINDINGS:

Cause Related:
1. The pilot stopped the aircraft close to where a small stream entered the lake.

2. The ice, which had been weakened by the action of the stream, would not support the weight of the aircraft; as a result, the aircraft broke through the ice.

Other:
- Nil -

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CESSNA 172M C-GLGR
RED DEER, ALBERTA
10 DECEMBER 1985

REPORT NUMBER: 85-W50070 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 2010 MST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	75	75
LAST 90 DAYS	15	15

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was flying local circuits to qualify for a night endorsement. Several circuits were flown with an instructor after which the student flew another hour of touch-and-go landings. The wind was blowing 20 degrees from the left of the runway heading at six knots. On the final take-off with 20 degrees of flap selected, the pilot applied full power, and the aircraft lifted off unexpectedly. The pilot closed the throttle and raised the flaps. The aircraft was crabbed 20 degrees to the left of the runway heading when it settled back onto the runway. The aircraft ran off the side of the runway, collided with a snowbank, and ground looped.

On take-off, the pilot forgot to raise the flaps before applying full power, thus allowing the aircraft to become airborne prematurely. When the pilot raised the flaps and closed the throttle, he did not ensure that the aircraft was aligned with the runway on touchdown.

FINDINGS:

Cause Related:
1. An attempt was made to take off with 20 degrees of flap selected, causing the aircraft to become airborne prematurely.

2. The pilot lost directional control following a rejected take-off.

Other:
-Nil-

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CHAMPION 7ECA C-FVOO
LONG SAULT, ONTARIO 2 mi E
13 DECEMBER 1985

REPORT NUMBER: 85-O50093 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1615 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	97	10
LAST 90 DAYS	11	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was making his first landing at the private airstrip where he had arranged to store his aircraft for the winter. The pilot attempted to touch down at the start of the strip but undershot. The left gear struck a fence and was torn from the aircraft. The left wing and propeller struck the ground as the aircraft came to rest.

The landing strip was about 2,000 feet long, snow covered, and had electric wires and fences at both ends. The pilot attempted to touch down at the start of the strip because he was concerned that the strip was short and that braking effectiveness would be reduced on the snow. The pilot was unfamiliar with the strip and had only ten hours of experience on the aircraft type. These factors resulted in the pilot misjudging the approach, undershooting, and striking the fence.

FINDINGS:

Cause Related:
1. The pilot attempted to land at the start of the strip because of its short length and the reduced braking effectiveness on the snow-covered runway.

2. The short runway had obstructions located at both ends.

3. The pilot, because of his inexperience on type and his unfamiliarity with the private airstrip, misjudged the approach, undershot, and struck the fence.

Other:
-Nil-

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CESSNA 120 CF-ESF
GIMLI INDUSTRIAL PARK, MANITOBA
29 DECEMBER 1985

REPORT NUMBER: 85-C50097 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1640 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	412	249
LAST 90 DAYS	16	16

INJURIES	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot was flying an approach to runway 32 at Gimli, Manitoba. In order to avoid snow wind-rows on the right side of the approach end of the runway, the pilot landed on the left side of the runway. Just after touchdown, the aircraft veered to the left, and the pilot corrected with rudder. After the tail wheel touched down, the aircraft rolled a short distance before veering to the left again. The pilot was unable to correct with rudder; he advanced the throttle in an attempt to regain control, but the engine hesitated. The aircraft continued to the left, struck a snowbank at the side of the runway, and nosed over.

Gimli Industrial Park has a single asphalt runway 6,800 feet long by 150 feet wide. Snow-clearing operations are carried out only on weekdays; the accident occurred on a Sunday. At the time of the accident, snowbanks lined both runway edges, and snow windrows partially covered the south end of the runway. The north half of the runway was relatively clear. The aircraft touched down in the first 1,500 feet of the runway. With the conditions that existed at the time, the pilot could have expected a maximum landing roll of 400 to 500 feet. The prevailing wind was variable from the southwest at four knots.

The pilot stated that he had previously experienced engine hesitation problems with this aircraft. He felt that the carburettor heat push-pull control was effective only in its last one-half-inch of travel and suspected that the control tended to creep back in after being selected to the hot position. He also stated that the majority of his recent flying experience had consisted of flights of one to three hours duration, with one take-off and landing on each.

The pilot's decision to land on the portion of the runway which was partially snow covered left him little room for error. The pilot also lacked recent practice in landings and was unable to maintain directional control in the light cross-wind. When the pilot attempted to use engine power to regain directional control, the engine hesitated for undetermined reasons. As a consequence, the aircraft continued off the side of the runway and struck the snowbank.

FINDINGS:

Cause Related:

1. The pilot landed on a portion of the runway which was partially covered with snow when a suitable clear area was available further along the runway.

2. The pilot had not practised landings recently and was unable to maintain directional control in the light cross-wind.

3. When the pilot attempted to add power to regain directional control, the engine hesitated for undetermined reasons.

4. As the aircraft left the runway, it struck a snowbank and nosed over.

Other:
-Nil-

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ALON A-2 C-GODM
SUDBURY AIRPORT, ONTARIO
02 JANUARY 1986

REPORT NUMBER: 86-O60001 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1317 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	209	169
LAST 90 DAYS	12	12

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot had completed several circuits. During the final approach to runway 04, he adjusted the throttle, but the engine did not respond. After hearing a "pop" similar to an engine backfire, the pilot pumped the throttle, and the engine sounded as if it was going to run but then lost complete power. The aircraft was forced-landed in a snow-covered field, approximately 3,000 feet short of the runway. The flight lasted 42 minutes.

The reported temperature was minus 12 degrees Celsius, and the dew point was minus 16 degrees Celsius. The aircraft had been parked outside and the vent holes on top of the fuel caps allowed water to enter the tanks. During the pre-flight inspection, the pilot reported that he did not detect any water in the fuel. The pilot had previously experienced the centre fuselage tank quantity indicator sticking and did not pay attention to its indication.

This type of aircraft has three fuel tanks, one in each wing root and one in the centre fuselage. The fuel is pumped from the wings by an engine-driven fuel pump into the centre fuselage tank. The pump discharge fitting has a restrictor orifice to restrict the fuel flow into the centre tank. The fuselage tank holds six gallons, and the aircraft has an endurance of approximately 45 minutes when the engine is being supplied by this tank only.

An examination of the aircraft revealed that the centre fuselage tank was empty, and the quantity indicator corresponded to this state. The wing tanks were indicating three-quarters full, and the actual level confirmed that the indicator was correct. The carburettor drain plug was removed, and approximately one and one-half ounces of fuel drained out. The fuel pump was examined, and an appreciable amount of water was found in the outlet cavity and in the restrictor fitting. No mechanical irregularities were found. The fuel drained from the carburettor bowl corresponded to the amount which would remain unused in the event of fuel starvation.

The fuel cap design allowed water to enter the tanks. In the low temperature that prevailed, the water which was found in the pump and in the restrictor fitting froze and blocked the fuel supply to the fuselage tank. The fuselage tank quantity indicator was not being monitored; consequently, the pilot was unaware that the level was decreasing while the level in the wing tanks remained constant. The fuel gauges are the only indication to the pilot of a fuel transfer malfunction. The fuselage tank provides an endurance of approximately 45 minutes, and the flight lasted 42 minutes. These times indicate that the transfer fuel supply was restricted when the aircraft took off.

The reported backfire was caused by the mixture becoming excessively lean as the fuel supply was being exhausted from the carburettor bowl.

FINDINGS:

Cause Related:
1. The fuel cap design allowed water to enter the fuel tanks.

2. Because of the low temperatures that prevailed, the water froze and blocked the flow of fuel to the fuselage tank, causing the engine to lose power due to fuel starvation.

3. The pilot did not monitor the fuel quantity indicators.

Other:
-Nil-

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BRITTEN-NORMAN BN2A-6 C-GTPB
CARIBOU HORN LAKE,
NORTHWEST TERRITORIES
13 JANUARY 1986

REPORT NUMBER: 86-C60002 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 0915 CST
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4,000	160
LAST 90 DAYS	181	160

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot commenced his take-off run from an ice airstrip. The aircraft tended to veer to the right, and the pilot used differential power to keep the aircraft straight. After a ground run of about 300 feet, the aircraft swung sharply to the right and struck a 45-gallon drum used as a runway marker. The aircraft came to rest 200 feet off the side of the runway.

The aircraft nosewheel had undergone an approved modification from a steerable configuration to a castoring, self-centering configuration. The aircraft had been parked for two nights on the ice strip in temperatures of minus 40 degrees Celsius, with the nosewheel turned to the right. The temperature at the time of take-off was minus 38 degrees Celsius. Because of the cold temperatures, the nosewheel assembly froze in the position it was in when the aircraft was parked, and the freezing was such that it rendered the self-centering mechanism ineffective.

This take-off was the pilot's first from an icestrip. He did not recognize that the aircraft's tendency to veer to the right was a result of the cocked nosewheel and thus continued the take-off attempt. Most of the damage to the aircraft occurred when its right propeller struck the 45-gallon drum being used as a runway marker.

FINDINGS:

Cause Related:
1. After the aircraft had been parked for an extended period in very cold temperatures, the nosewheel assembly froze with the wheel cocked to the right.

2. When the pilot attempted a take-off with the cocked nosewheel, he was unable to maintain directional control, and, as a result, the aircraft ran off the runway.

3. The aircraft collided with a 45-gallon drum used as a runway marker.

Other:
-Nil-

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CESSNA 172M C-GWUA
MCLAUGHLIN, ALBERTA 2 mi SE
4 FEBRUARY 1986

REPORT NUMBER: 86-W60003 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1310 MST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	250	235
LAST 90 DAYS	25	25

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The aircraft did not become airborne on a take-off attempt from a 1,900-foot snow-covered farm strip. It overran the end of the runway, passed through a fence, crossed a road, and hit a ditch embankment. All three occupants received facial cuts, bruises, and abrasions. The occupants of the two front seats were not wearing the shoulder harnesses provided.

The investigation did not reveal any aircraft pre-accident malfunction or failure, and weather was not a factor at the time of the occurrence. The aircraft had been parked uncovered outside for several weeks, and a rough layer of ice, varying in depth from one-quarter to one-half inches, covered the upper surface of the wings. The pilot had swept an accumulation of snow from the aircraft before the take-off attempt but did not believe the remaining ice would affect take-off performance. The ice destroyed the lift characteristics of the wings and prevented the aircraft from becoming airborne, even though the aircraft had reached more than normal take-off speed. Engine power was not reduced until the collision with the ditch.

It is probable that, had the front-seat occupants been wearing the shoulder harnesses provided, their injuries would have been minimized.

FINDINGS:

Cause Related:
1. Ice on the upper surface of the wings prevented the aircraft from becoming airborne.

2. The pilot did not reject the take-off when it became obvious the aircraft was not going to fly.

Other:

1. The front-seat occupants did not have their shoulder harnesses fastened.

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PIPER PA-30 TWIN COMANCHE C-FTDV
VALCOURT, QUEBEC
12 FEBRUARY 1986

REPORT NUMBER: 86-Q60005 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1530 EST
OPERATION: Private Testing
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,300	400
LAST 90 DAYS	9	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The purpose of this flight was to allow the pilot to compare the performance of the aircraft with his own newer aircraft of the same type. The aircraft owner was in the right-hand seat. After a short test flight, the pilot lined up for landing. During the final approach, the owner told the pilot that he was too high and suggested that he reduce speed in order to prevent the aircraft from floating above the runway before touching down. Following a power reduction, the angle of descent increased. The pilot then opened the throttle again to reduce the descent angle and land on the runway. On short final, the occupants felt a shock. After the aircraft had rolled along the runway for about 1,500 feet, the right gear collapsed, and the aircraft came to rest on the runway.

The right wheel had struck a four- and one-half-foot pylon in line with the runway centre line and 165 feet beyond the threshold. This pylon had been erected to support a light intended as a reference point for precision landings. The right gear failed as a result of a strong rearward stress.

The aircraft struck the obstacle during the approach because its approach path was too low. After the partial breakage resulting from impact with the obstacle, the right gear failed during the landing roll.

FINDINGS:

Cause Related:

1. Because the approach was too low, the right wheel struck a pylon located beyond the threshold.

2. The right gear was damaged by the impact with the pylon and collapsed after the touchdown.

Other:

-Nil-

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PIPER PA-34-200 C-FGNG
GOOSE BAY, LABRADOR
15 FEBRUARY 1986

REPORT NUMBER: 86-A60004 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1827 AST
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	6,500	300
LAST 90 DAYS	15	4

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot and passenger departed St. John's, Newfoundland on a flight to Goose Bay, Labrador. Strong winds were encountered en route, and the pilot decided to land at St. Anthony, Newfoundland to refuel. In preparation for landing, difficulty was experienced in obtaining a down-and-locked indication for the nose gear. The pilot reselected the gear selector lever a couple of times, and the light came on. The nose gear was examined visually after landing by both the pilot and the passenger who was an aircraft maintenance engineer; however, no fault was found.

The flight then continued to Goose Bay, Labrador. During the approach to Goose Bay, the landing gear was selected down, and the nose gear indicated unsafe. A visual inspection confirmed that the nose gear doors were not open. Attempts to lower the nose gear by aircraft manoeuvring and by the emergency gear lowering system were unsuccessful. The pilot then attempted to jar the nose gear loose by bouncing the aircraft's main wheels on the runway. During this attempt, the aircraft pitched forward slightly, and the propellers struck the runway. The pilot closed the throttles, lowered the nose slowly to the runway, and the aircraft came to a stop on the main wheels and the aircraft nose.

The bolt attaching the nose gear centering spring to the nose leg was reversed during installation on previous maintenance. As a result, there was insufficient clearance between the end of this bolt and the door closing actuator when the gear was retracted. On extension of the gear, this bolt end jammed and prevented the nose gear from extending.

Wear on the right rear side of the actuator assembly indicated this condition had existed for a number of extensions of the landing gear.

FINDINGS:

Cause Related:

1. During previous maintenance, a bolt in the nose gear assembly was incorrectly installed.

2. When the landing gear was selected down, the bolt jammed on the door closing actuator and prevented the nose gear from extending.

Other:

- Nil -

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BOEING N75 STEARMAN C-FKPX
CALAHOO, ALBERTA
01 MARCH 1986

REPORT NUMBER: 86-W60006 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1515 MST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	550	5
LAST 90 DAYS:	0	0

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot landed the aircraft on a farm airstrip, and, during the landing roll, the right wheel dug into snow. The aircraft swung to the right and nosed over.

The airstrip was wet, muddy, and partially snow covered. The pilot had taken off uneventfully from the airstrip minutes earlier. On landing, he kept the aircraft to the side of the airstrip to avoid the soft, centre section; however, the right wheel hit deep snow and some small bushes along the airstrip edge, which caused the aircraft to nose over. The airstrip was not in a suitable condition for aircraft operations.

FINDINGS:

Cause Related:
1. The pilot landed on an unsuitable airstrip.

Other:
-Nil-

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PIPER PA-22-135 TRIPACER C-FKGJ
EUCHINIKO LAKES, BRITISH COLUMBIA
20 MARCH 1986

REPORT NUMBER: 86-P60011 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1200 PST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	246	50
LAST 90 DAYS	34	34

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

Following the landing roll on a frozen lake, the pilot taxied the wheel-equipped aircraft to the end of the runway to turn around and park. During the taxi, the nosewheel broke through the surface, and the aircraft nosed over.

The ice strip was approximately 2,800 feet long and was marked off with branches. According to the pilot, the area where the nosewheel broke through had flooded on a previous day, and the flooding had left a patch of weak and porous ice. As the pilot had completed the touchdown and landing roll without difficulty, he did not expect the ice at the end of the runway to be unsafe.

FINDINGS

Cause Related:
1. The pilot selected an unsuitable area for the turnaround, and, as a result, the nosewheel broke through a patch of weak and porous ice.

Other:
-Nil-

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MAULE M4 C-GAQA
EEL LAKE AIRSTRIP, NEW BRUNSWICK
01 APRIL 1986

REPORT NUMBER: 86-A60008 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1830 AST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	246	23
LAST 90 DAYS	1	1

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot planned to check out the aircraft and do some practice flying. The ground was soft and muddy on the end of runway 07 and, during the taxi through this area, some mud was thrown up onto the aircraft. The pilot continued to the other end of the runway which was dry, stopped and cleaned off the mud. He then boarded the aircraft, accompanied by his son and the family dog.

The take-off was normal, and they flew around the local area for approximately 25 minutes and then set up an approach for the end of runway 25. The pilot's objective was to land as close as possible to the button, using a short-field landing technique.

The approach appeared to be normal, but, during the flare, the aircraft touched down about 100 feet short of the runway on rough upsloping ground, bounced a couple of times, and came to rest upright on the button of the runway. The pilot was injured and could not move; his son and dog were unhurt and evacuated the aircraft. The son went to his house and arranged for an ambulance. In the meantime, a man who was watching the flight helped the pilot exit the aircraft and, with assistance from the son, took him to his home to await the ambulance.

The runway was gravel surfaced and about 1,500 feet long and 57 feet wide. Approximately 500 feet of the end of runway 07 was lower than the remainder, and it was water soaked and too soft for use. There was no usable overrun on either end of the runway. It terminated at a highway at one end, and, at the other end, the overrun was upslope to the button of 25 and was covered with rocks, shrubs, and slash. There was also a slight rise in the first one-third of runway 25, then a downslope towards the other end.

The pilot had not flown in the previous four months and his total flying experience of 246 hours was obtained over a period of 20 years. The certificate of airworthiness for the aircraft was invalid as the Condition and Conformity Inspection had not been carried out. The pilot's licence validation certificate was expired.

The pilot was attempting a short-field landing in order to land as close to the button as possible and to avoid the soft area of the runway; however, the aircraft touched down short of the button.

Because of the lack of current flying experience, the pilot would not have retained the skill required to carry out this type of performance landing.

FINDINGS:

Cause Related:

1. The undershoot area of the runway was on an upslope and was obstructed by rocks, slash, and shrubs.

2. In order to avoid the soft, muddy portion of the runway, the pilot attempted a short-field landing; however, the aircraft touched down 100 feet short of the runway.

3. The pilot lacked sufficient total and current flying experience to successfully execute the short-field landing.

Other:

1. The Certificate of Airworthiness was invalid as the Condition and Conformity Inspection had not been carried out.

2. The pilot's licence validation certificate was expired.

* * * * *

ERCO 415C ERCOUPE CF-NMC
SAINT JOHN, NEW BRUNSWICK
06 APRIL 1986

REPORT NUMBER: 86-A60009 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1327 ADT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	660	400
LAST 90 DAYS	16	15

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was practising forced landings to a 7,000-foot runway. The wind was 200 degrees magnetic at seven knots. He shut down the engine at 3,500 feet above sea level or approximately 3,200 feet above the runway elevation. When the aircraft was downwind for runway 25, opposite the threshold at approximately 1,000 feet above ground, the aircraft developed a rapid rate of descent. The pilot did not restart the engine in time, and the aircraft touched down 95 feet short of the threshold. The nose gear collapsed when it struck the edge of the threshold, and the aircraft slid to a stop on the runway.

The pilot stated that he encountered severe downdrafts that were caused by a combination of the wind and nearby hills. The downdrafts produced an uncontrollable rate of descent, which caused the aircraft to land short of the runway. After he realized that the aircraft was undershooting, the pilot did not have time to restart the engine.

FINDINGS:

Cause Related:
1. The pilot shut down the engine during a practice forced landing.

Other:
-Nil-

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LUSCOMBE 8A SILVAIRE C-GRVG
FORT ST. JAMES AIRPORT,
BRITISH COLUMBIA
10 APRIL 1986

BRIEF NUMBER: 86-P60015 (Accident)
LOCAL TIME: 1700 PST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,500	10
LAST 90 DAYS	50	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

The pilot applied heavy braking on landing, and the aircraft swung to the left. To maintain directional control, the pilot decreased pressure on the left brake pedal and increased it on the right, whereupon the aircraft nosed over.

A bevelled aluminium flange ring in the left brake assembly had been installed in reverse. As a result, the brake drum outer ring was without support and warped when heavy braking was applied. When the drum warped, the brake shoe caught and seized.

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GRUMMAN AMERICAN AA5A CHEETAH C-GIQO
WOODGREEN, ONTARIO 1 mi S
12 APRIL 1986

REPORT NUMBER: 86-O60018 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1545 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	127	33
LAST 90 DAYS	47	13

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The aircraft took off on a visual flight rules (VFR) flight from St. Catharines to St. Thomas, Ontario. En route the passenger asked to be dropped off at a private airstrip just south of Woodgreen, Ontario.

The runway at the private strip was sod covered, approximately 2,200 feet long, and was designated 07/25. There were power lines along a road adjacent to the private airstrip, and they crossed the approach path near the threshold of runway 25. The pilot chose to land on runway 25 because of more favourable wind conditions.

On final approach, and after clearing the power lines, the pilot steepened the approach to land the aircraft just beyond the threshold. After flaring, the aircraft landed hard on the main gear, bounced back into the air, and then struck the ground with only the nose gear. The aircraft bounced twice more on the nose gear before a "cracking" sound was heard by the pilot. Suspecting the nose gear was damaged, the pilot kept easing back on the yoke, not allowing the nose gear to touch the ground as the aircraft rolled down the runway.

When the nose could no longer be held up, the nose gear contacted the ground and collapsed. The aircraft then slid on its nose and came to rest 116 feet from the end of the runway.

After the aircraft had cleared the power lines, the pilot set up a rapid rate of descent; however, he was unable to recover during the flare, and the aircraft bounced on touchdown.

Following the bounce, the pilot did not add power to cushion the second touchdown as recommended in Transport Canada's Flight Training Manual. The nose gear strut failed in overload during the repeated bounces. The nose gear, which was then held in position by the strut fairing that is attached to the fuselage, collapsed when it was subjected to the weight of the aircraft.

FINDINGS:

Cause Related:
1. The aircraft's rate of descent on final approach was increased, and the pilot was unable to recover in the flare.

2. The pilot did not use the recommended bounce recovery procedure.

Other:
-Nil-

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CORNWALL AVIATION (1979) LIMITED
CESSNA 172 C-GIEC
ELLIOT LAKE, ONTARIO 5 mi S
13 APRIL 1986

BRIEF NUMBER: 86-O60017 (Accident)
LOCAL TIME: 1830 EST
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	950	85
LAST 90 DAYS	28	12

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

REPORTED CIRCUMSTANCES:

The pilot was flying at about 50 feet above ground level as training for spraying operations. The aircraft was passing over Glen Lake when the wheels contacted the lake surface which was frozen but slush covered. The pilot applied full power and up elevator, but the aircraft remained on the surface and slowed down. Just before the aircraft stopped, the nosewheel broke through the ice. After the occupants had evacuated the aircraft, it broke through the ice and sank in 40 feet of water.

The weather at the time was clear, the visibility was more than 15 miles, and the temperature was about 11 degrees Celsius. The pilot was estimating his height above the ice surface by reference to the lake shore and a small island. He was flying toward the sun, there was glare off the ice, and the windscreen was slightly dirty, which, when combined with the lack of good terrain features, made height estimation difficult.

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TAYLORCRAFT BC12D C-FQFL
SALMON ARM AIRPORT, BRITISH COLUMBIA
17 APRIL 1986

BRIEF NUMBER: 86-P60016 (Accident)
LOCAL TIME: 1200 PST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	60	30
LAST 90 DAYS	N/A	12

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

A student pilot, practising circuits and landings, had completed one landing successfully. On the second landing, while trying to avoid a frost-heaved area, the pilot lost directional control, and the aircraft ran off the left side of the runway. The pilot attempted to correct the swing; however, the aircraft ground looped right, ran across the runway into a soft construction area, and nosed over.

The frost-heaved area was about 500 feet from the threshold of a 3,990-foot runway. The pilot had touched down beyond the frost heave on the first landing.

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CESSNA 182 C-GBBW
SIMCOE AIRPORT, ONTARIO
04 MAY 1986

BRIEF NUMBER: 86-O60027 (Accident)
LOCAL TIME: 1100 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,000	900
LAST 90 DAYS	10	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	4

REPORTED CIRCUMSTANCES:

While the aircraft was taxiing for take-off, the right main spring strut failed. The aircraft veered right and came to rest in a right-wing-low, nose-up attitude.

A pre-crack in the lower face of the strut weakened the strut to the point where it broke under normal loads. It was not determined what initiated the pre-crack.

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CESSNA 310D C-FFEK
TORONTO/LESTER B. PEARSON INTERNATIONAL AIRPORT, ONTARIO
13 MAY 1986

REPORT NUMBER: 86-O60033 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0936 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	340	40
LAST 90 DAYS	15	6

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY:

The aircraft departed Buttonville Airport on a visual flight rules (VFR) flight with a pilot and one passenger on board, en route to Toronto/Lester B. Pearson International Airport. Approximately 15 minutes later, the flight was cleared by the Toronto/Lester B. Pearson International tower controller to land on runway 24 Right "with the gear down". The pilot acknowledged the clearance by replying "clear to land". The pilot continued the approach, and the aircraft touched down with the landing gear in the retracted position.

The pilot did not use the on board check-list for the after-take-off, in-range or landing checks but, instead, relied on memory. The landing gear warning horn did not activate in time because of the high throttle setting used on approach.

In the VFR environment in a busy control zone, a pilot requires acute concentration to be completely aware visually and audibly of his surroundings and air traffic control (ATC) instructions. At this time of increased workload, it is not always prudent to rely on memory for check-lists. When the aircraft was cleared to land "with the gear", the pilot did not confirm verbally that the gear was down, and, in fact, he had forgotten to lower the gear.

FINDINGS:

Cause Related:

1. The pilot did not use the check-list for the final landing checks.

2. The pilot did not lower the landing gear.

Other:
-Nil-

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UNIVAIR STINSON 108-3 C-GCYY
HYTHE, ALBERTA 7 mi N
16 MAY 1986

BRIEF NUMBER: 86-W60013 (Accident)
LOCAL TIME: 1245 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	198	20
LAST 90 DAYS	21	20

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

REPORTED CIRCUMSTANCES:

Following a day of rain and snow, the pilot attempted take-off from a private grass strip. The aircraft went through several wet, soft areas that prevented it from accelerating to take-off speed. Two thirds down the runway, the take-off was rejected, but traction on the wet grass was insufficient to allow the aircraft to stop before overrunning the strip. The aircraft collided with a fence, and the empennage caught a power line as the aircraft nosed over.

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CESSNA T210M N21CT
SOUTH BENTINCK ARM, BRITISH COLUMBIA
25 MAY 1986

REPORT NUMBER: 86-P60902 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1330 PDT
OPERATION: Private Recreational
DAMAGE: Missing
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,500	1,600
LAST 90 DAYS	45	45

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot and his passenger had waited all morning for the weather to improve. After the pilot had obtained a weather briefing, and filed a 24-hour Flight Notification, the aircraft took off from Port Hardy, British Columbia in visual meteorological conditions (VMC). The aircraft was flying along Burk Channel en route to Moose Lake, and the pilot turned into South Bentinck Arm, rather than continue toward Bella Coola, British Columbia, which was on the visual flight route through the mountains. The pilot reported that, while the aircraft was cruising at about 500 feet above the water, with the autopilot altitude hold engaged and the airspeed reduced, he was consulting a flight supplement for Bella Coola's radio frequency. When he looked up, he noticed that the aircraft was approaching the water. An attempt to arrest the descent was unsuccessful, and the aircraft struck the water and sank. The pilot and his passenger exited the aircraft and swam to shore The pilot then swam toward a logging camp; he was noticed by the operators of a boat, and both the pilot and his passenger were taken to the logging camp.

At the time of departure, the weather at Port Hardy and Bella Coola was reported as VMC, with light rain at the latter. During the weather briefing, the pilot was informed that deteriorating conditions, in the form of fog and low clouds, could be encountered in the inlets. Two witnesses, who saw the aircraft fly along the South Bentinck Arm, and who later assisted the two aircraft occupants, stated that the visibility was reduced in mist, rain and fog, the cloud base was between 1,000 and 1,500 feet, and that there was a layer of fog between 50 and 60 feet thick, immediately above the water's surface.

As the aircraft is still submerged, the serviceability of the autopilot could not be determined. The pilot did not report any aircraft failure or malfunction.

For undetermined reasons, the pilot entered the South Bentinck area rather than continue toward Bella Coola and the visual flight route through the mountains.

FINDINGS:

Cause Related:
1. The aircraft lost altitude for undetermined reasons, struck water, and sank.

Other:
-Nil-

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CESSNA 172 N3746F
ANAHIM AIRPORT, BRITISH COLUMBIA
26 MAY 1986

REPORT NUMBER: 86-P60903 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1030 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	425	215
LAST 90 DAYS	15	5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

The aircraft departed Anahim Lake Airport, British Columbia on a visual flight rules flight to Bremerton, Washington, USA. Following take-off, the aircraft failed to gain altitude, and the pilot landed the aircraft in a swamp.

Anahim Lake is 3,700 feet above sea level. There was no wind on the take-off roll, but the pilot reported that he encountered a wind shear shortly after lift-off. The temperature was 18 degrees Celsius, and the aircraft's weight was calculated to have been 116 pounds above the maximum allowable.

The pilot used 10 degrees of flap during take-off. He also used rich fuel mixture. The manufacturer recommends that flaps not be used for a high altitude take-off at maximum weight, because climb performance would be marginal. The manufacturer also recommends that the fuel mixture be leaned above 3,000 feet to obtain maximum rpm.

The aircraft's performance was degraded by excess weight, use of 10 degrees of flap, high altitude and temperature, and the use of rich mixture, such that it could not climb sufficiently to clear the terrain.

FINDINGS:

Cause Related:
1. The pilot did not operate the aircraft in accordance with the manufacturer's performance recommendations for a high altitude, maximum weight take-off.

2. The excess weight of the aircraft contributed to its reduced performance.

Other:
-Nil-

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CESSNA 170B CF-BJI
KINKORA, PRINCE EDWARD ISLAND
31 MAY 1986

BRIEF NUMBER: 86-A60015 (Accident)
LOCAL TIME: 1812 ADT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	460	187
LAST 90 DAYS	19	19

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

REPORTED CIRCUMSTANCES:

The pilot selected a 2,500-foot-long field on which to land, flew two circuits to check the field, and then attempted a landing. Approximately one third of the way down the field and just prior to touchdown, he elected to go around. At this time, the airspeed was approximately 45 knots and the stall warning was buzzing. On climb-out, the aircraft struck a tree at the end of the field, flew across a highway and struck a telephone pole, before coming to rest upright in a church parking lot.

The field selected for landing had a gradual downslope towards the middle from both ends. The pilot elected to go around because he thought that he could not stop in the distance remaining.

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CHATHAM AIR SERVICES LTD.
CESSNA 172M C-GUJK
CHATHAM, NEW BRUNSWICK
04 JUNE 1986

REPORT NUMBER: 86-A60016 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0105 ADT
OPERATION: Undetermined
DAMAGE: Destroyed
PILOT LICENCE: Undetermined

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	Unknown	Unknown
LAST 90 DAYS	Unknown	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The accident occurred during quiet hours on the Military Air Base. The runway lights were turned off, and the tower was closed as per normal operating procedure. Just after one o'clock in the morning, several witnesses living in the permanent married quarters (PMQs), just north of the airfield, heard an aircraft flying over the PMQs, and, seconds later, they heard a crash. Another witness who was on a highway overpass approaching the airbase saw the aircraft as it flew through the car's headlight beams. The aircraft was flying east to west at an estimated altitude of 200 feet in a left-bank attitude over the PMQs.

A crash-fire-rescue unit was dispatched and located the aircraft beside a parallel taxiway 2,000 feet north of runway 09/27. The unit proceeded to the aircraft to render assistance but found that the aircraft was unoccupied. A search of the area was conducted; however, no sign of any occupant was found.

The aircraft was based in Chatham, New Brunswick and operated on the civilian side of the airbase. The hangar in which the aircraft was kept showed signs of illegal entry.

The aircraft was in a 70-to 80-degree left-bank attitude on a heading of 090 degrees magnetic when it struck the runway. It travelled 450 feet from the point of first impact to where it came to rest in an inverted position. The cockpit was extensively damaged, yet there was no evidence to indicate that it was occupied at the time of impact. The throttle was found in the full-open position; this, combined with the marks on the propeller and the gouges in the taxiway, indicates that the engine was at full power. The aircraft records in conjunction with the aircraft hour meter indicated that the flight duration had been less than six minutes.

FINDINGS:

Cause Related:
1. The aircraft was unoccupied and uncontrolled when it crashed.

Other:
-Nil-

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LUSCOMBE 8E C-FGJF
WYOMING, ONTARIO
14 JUNE 1986

REPORT NUMBER: 86-O60048 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0946 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	530	475
LAST 90 DAYS	10	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot carried out a three-point landing on a 2,250-foot grass strip, and, shortly after, the left main landing gear leg collapsed. The aircraft veered to the left, and the pilot immediately shut down the engine. As the airspeed decreased, the left wing dropped, and the wing tip struck and dragged along the ground. The aircraft came to rest in a shallow ditch to the left of the runway.

The weather was good with clear skies and a wind of five knots at 70 degrees to the left of the runway heading.

The gear leg was weakened by fatigue pre-cracking which had occurred at the end of four welding beads that join two separate reinforcing plates to the inner surface of the hollow leg tube. The weakened gear leg failed in overload during the landing.

The following laboratory report was completed:
LP 136/86 - Main Gear Leg Failure.

FINDINGS:

Cause Related:
1. The left main landing gear leg failed as a result of fatigue pre-cracking at four welds on the inner surface of the leg tube.

Other:
-Nil-

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CHAMPION 7GCAA CITABRIA C-GUOC
MILTON, ONTARIO 3 mi SE
21 JUNE 1986

BRIEF NUMBER: 86-O60047 (Accident)
LOCAL TIME: 1110 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	100	15
LAST 90 DAYS	20	15

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

The pilot was landing the tail-wheel-equipped aircraft after a pleasure flight from Guelph. The approach was high, and the pilot pushed the nose of the aircraft down, thereby increasing the airspeed on final approach. The aircraft landed approximately half-way down the 1,200-foot runway, bounced, then floated a short distance before settling back onto the runway. The pilot realized there was insufficient distance remaining, in which to stop; he braked heavily, and the aircraft nosed over.

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AEROWEST AVIATION
PIPER PA-32-R300 N1212E
TWIN LAKES, BRITISH COLUMBIA
29 JUNE 1986

REPORT NUMBER: 86-P60906 (Accident)
INFORMATION SOURCE: Office Investigation
LOCAL TIME: 1300 PDT
OPERATION: Flying Club Recreational
DAMAGE: Substantial
PILOT LICENCE: Private (U.S.A.)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	986	122
LAST 90 DAYS	24	11

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	5

SUMMARY REPORT:

Following lift-off from the runway, the aircraft struck the right wing tip of an aircraft parked beyond the end of the runway. The aircraft remained airborne in a near-stalled condition for an additional 550 feet, before mushing into the shallow water of Elkin Lake, in a wings-level, nose-up attitude. The aircraft came to rest in an upright position and sank. The six occupants exited without difficulty and waded ashore.

The pilot was familiar with the conditions of the aerodrome, and he was also aware of the parked aircraft at the extreme north end of the runway. He had carried out a comprehensive pre-flight preparation and had monitored the wind for some time before deciding to take off to the north. An eight-knot head wind was blowing at the time of take-off. Prior to take-off, the wind had been shifting from north to south.

The take-off had commenced with the wing flaps in the up position. About half-way down the runway, however, the pilot extended the flaps to the recommended setting of 25 degrees. The aircraft lifted off about two-thirds down the runway. To allow the airspeed to build up, the pilot kept the aircraft from climbing. He noticed that a camper-truck had stopped on the road which crossed the far end of the runway. To avoid the vehicle, the pilot pulled the aircraft's nose up sharply and banked right, and the aircraft stall warning sounded. Although a collision with the camper-truck was avoided, the aircraft struck the wing tip of an aircraft that was parked beyond.

The take-off area was the turf runway of an unlicensed aerodrome 4,000 feet above sea level (asl). The published runway length is 3,600 feet, and there is a road which crosses its northern end. While both the aircraft and camper-truck were parked within the width of the runway, it could not be determined if either or both were within the normally used runway area. There is no public record of a runway survey, and there are no signs posted to alert road traffic of the active aerodrome.

According to information in the Pilot's Operating Handbook (PA-32R-300), the correct technique for short-field or obstacle-clearance take-off is with the wing flaps extended 25 degrees from the beginning of the take-off roll. In this configuration, with a 10 per cent rough surface allowance, the aircraft should have lifted off after 1,350 feet of take-off roll and cleared a 50-foot obstacle at a take-off distance of 2,450 feet.

No pre-occurrence failures or malfunctions of the aircraft or any of its systems had been reported. A weight and balance calculation showed that the aircraft's weight and centre of gravity were within the prescribed limits.

The aircraft was accelerating along the runway. Its angle of attack and lift were suddenly increased, when the pilot extended the wing flaps to 25 degrees. The aircraft became airborne before a safe flying speed was reached. The pilot kept the aircraft level to allow the airspeed to increase. When the attitude of the aircraft was abruptly altered to avoid a collision, the benefits of ground effect diminished, and the aircraft entered a near-stalled condition. There was insufficient altitude for obstacle avoidance or recovery, and, as a result, the aircraft struck the parked aircraft and mushed into the water.

FINDINGS:

Cause Related:

1. The unexpected appearance of a vehicle within the take-off path of the aircraft forced the pilot to abruptly alter the attitude of the aircraft.

2. Abrupt changes in aircraft attitude, shortly after lift-off, resulted in a loss of aircraft control.

Other:

1. There are no signs posted to warn road traffic that aircraft may be taking off or landing on the runway.

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CESSNA 180 SKYWAGON C-GRDY
CLARESHOLM, ALBERTA
02 JULY 1986

BRIEF NUMBER: 86-W60027 (Accident)
LOCAL TIME: 1530 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private (U.S.A.)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	N/A	N/A
LAST 90 DAYS	N/A	N/A

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

REPORTED CIRCUMSTANCES:

The aircraft had landed in strong gusty wind conditions. During the landing roll, a gust of wind lifted one wing; the other wing struck the ground, and the aircraft nosed over.

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CESSNA T210N CENTURION N6444N
SAULT STE. MARIE, ONTARIO
11 JULY 1986

BRIEF NUMBER: 86-O60904 (Accident)
LOCAL TIME: 1451 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,750	1,000
LAST 90 DAYS	8	8

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

REPORTED CIRCUMSTANCES:

During the landing roll, the pilot inadvertently moved the landing gear position handle to the gear-up position, and the nosewheel retracted. The aircraft slid about 500 feet on its nose structure before coming to rest on the runway centre line.

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PIPER PA-18A SUPERCUB C-FDYC
DEEP RIVER, ONTARIO 2 mi E
12 JULY 1986

BRIEF NUMBER: 86-O60055 (Accident)
LOCAL TIME: 1100 EDT
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	180	3
LAST 90 DAYS	25	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

The pilot had just completed three hours of dual instruction on a tail-wheel-equipped aircraft and was taxiing downwind on the runway for take-off on his first solo flight on type. He increased speed and raised the tail to quickly reach the take-off point. Upon reaching the end of the runway, speed was reduced and directional control was lost. The aircraft ground looped to the right, and the left wing and horizontal stabilizer struck the runway.

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CESSNA 140 C-FJCX
BLACK DIAMOND, ALBERTA 1 mi NE
15 JULY 1986

REPORT NUMBER: 86-W60031 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2020 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	310	50
LAST 90 DAYS	50	8

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was landing the aircraft on a service road that ran through a grain field. The pilot had difficulty maintaining directional control, and, as the aircraft slowed, it turned right, into the soft cultivated field. The main gear dug into the ground, and the aircraft nosed over.

When the aircraft was inspected, it was found that the right-hand main wheel would not rotate. The left wheel was free to rotate. Inspection of the brake system showed that the parking brake locking tab on the right-hand master cylinder was engaged. When this tab was released, the right wheel turned freely.

The pilot stated that, occasionally, the parking brake had engaged during brake application while the aircraft was taxiing. At these low speeds, it had not presented a serious problem, so the defect was not rectified. The cause of the parking brake engagement was not determined.

Drag from the locked right main wheel caused the aircraft to yaw sharply to the right during the landing roll.

FINDINGS:

Cause Related:
1. Directional control of the aircraft was lost because the right wheel parking brake was engaged.

2. The pilot did not take action to rectify a known defect.

Other:
-Nil-

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CHAMPION 7ECA CITABRIA C-FSIB
MAXVILLE, ONTARIO
16 JULY 1986

REPORT NUMBER: 86-O60056 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2020 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	95	15
LAST 90 DAYS	22	15

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

During a local visual flight rules (VFR) flight, the aircraft was flown from Maxville, Ontario to the Cornwall Regional Airport to refuel. Just prior to joining the circuit at Cornwall, the pilot observed the airspeed indicator increase to 180 mph and then decrease to zero mph where it remained. The aircraft was safely landed and refuelled. At this time, the pilot and another local pilot visually inspected the aircraft pitot-static system. A thin wire was gently fed up the pitot mast to clear any obstructions within the pitot tube; however, the cause of the malfunction could not be determined.

The pilot then proceeded to Maxville with an en route stop at Alexandria. During this flight, the airspeed indicator appeared to function correctly. On arrival at Maxville, the pilot joined the circuit to land. Once established on final approach, the pilot reduced the throttle to idle and maintained an indicated approach speed of 70 mph. The aircraft was 20 to 30 feet over the landing strip, when the right wing dropped and the nose of the aircraft pitched down. The pilot was unable to recover from this position, and a hard landing resulted.

The pitot tube was partially blocked with debris. Even though the cause of the airspeed indicator malfunction was not determined and the procedure used to clear the pitot tube was incorrect, the pilot decided to continue his trip.

On short final approach at Maxville, the pilot observed the airspeed to be between 60 to 70 mph; however, the indicated airspeed was partially in error. The aircraft does not have a stall warning system and has a published stall speed of 51 mph. With an incorrect airspeed reading and no stall warning system, the pilot was unable to determine the actual airspeed of the aircraft. The aircraft stalled 20 to 30 feet above the landing strip, and the pilot was unable to recover successfully from this altitude. A hard landing resulted causing substantial damage to the aircraft.

FINDINGS:

Cause Related:

1. The pilot elected to continue his flight although the cause of the airspeed indicator malfunction was not determined and the procedure used to clear the pitot tube was incorrect.

2. A partially blocked pitot tube caused an incorrect airspeed indication on final approach.

3. The pilot was unable to determine the actual airspeed of the aircraft on final approach, and, as a result, the aircraft stalled 20 to 30 feet above the landing strip and landed hard.

Other:

-Nil-

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CESSNA 180H CF-SXN
HIGH LEVEL, ALBERTA
19 JULY 1986

BRIEF NUMBER: 86-W60032 (Accident)
LOCAL TIME: 0915 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	10,000	1,000
LAST 90 DAYS	30	30

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

REPORTED CIRCUMSTANCES:

A construction crew had dug a ditch one and one-half feet wide and three feet deep across the gravel taxiway. All but a five-foot section of the ditch had been filled in, and two short red flags marked the remaining hole.

While taxiing for take-off, the pilot did not see the hole or the flags, and the aircraft's right main gear dropped into the hole. Twenty minutes after the incident, a NOTAM stating "Runway, taxiway, and ramp lights under construction. Aircraft to use caution on approach to runway, taxiway, and ramp until approximately 08202300" was issued.

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CESSNA 150J C-GSAQ
GRANDVIEW, NORTHWEST TERRITORIES
27 JULY 1986

BRIEF NUMBER: 86-W60037 (Accident)
LOCAL TIME: 2000 MDT
OPERATION: Private Other
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	166	130
LAST 90 DAYS	30	30

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

REPORTED CIRCUMSTANCES:

The aircraft was at an altitude of 100 feet on base leg to land at the Grand View strip, when it encountered subsiding air, stalled and crashed into light bush.

* * *

CESSNA 185F C-FHSM
MARA LAKE, BRITISH COLUMBIA
09 JULY 1985

REPORT NUMBER: 85-P50026 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1745 PDT
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,200	1,000
LAST 90 DAYS	25	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

Following take-off from a runway, the pilot of the amphibious aircraft carried out a water landing at destination. Prior to landing, the pilot circled the landing area to check for obstructions and carried out a modified cockpit check. With the wheels in the down position, the aircraft touched down on the water, nosed over and sank.

The pilot had not fully completed the required pre-landing check for water landings and had omitted to confirm that the wheels were selected up for touch-down on the water. Contact between the extended wheels and the water surface caused the Cessna to nose over.

FINDINGS:

Cause Related:
1. The pilot did not fully complete the required pre-landing check for water landings and did not confirm that the wheels were retracted for landing.

Other:
-Nil-

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BELLANCA 7GCBC C-GOEP
SADDLE LAKE, MANITOBA
19 JULY 1985

REPORT NUMBER: 85-C50062 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2030 CDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	270	220
LAST 90 DAYS	5	5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

SUMMARY REPORT:

On arrival over the lake, the pilot of the float-equipped aircraft carried out a low pass over his intended landing site. He then initiated a right turn, at about 250 feet above the water, to reposition the aircraft for a landing. During the turn, the aircraft's angle of bank gradually increased to about 60 degrees, the nose gradually dropped below the horizon, and the aircraft started to descend rapidly. The pilot suddenly recognized his situation and applied left aileron. The aircraft struck the water in a steep nose-down and slightly right-wing-low attitude. The pilot was seriously injured.

The pilot's lap belt held, and, after having some difficulty in undoing the belt, the pilot was able to free himself from the wreckage. In addition to other injuries, the pilot sustained facial injuries when his head struck the instrument panel. The aircraft was not equipped with a shoulder harness.

The wind was light, and the aircraft's weight and centre of gravity were within the prescribed limits.

The pilot stated that his attention was focused on the landing site during the turn and that he did not observe the gradual attitude change until the aircraft was descending rapidly. As well, he did not recall releasing the back pressure on the control column when he attempted to recover. The aircraft's attitude on impact was characteristic of a spiral dive. Because of the low altitude at which the aircraft was flown, the pilot was unable to effect a recovery before the aircraft struck the water. Had a shoulder harness been available and worn, it is likely that the pilot would not have sustained the facial injuries.

FINDINGS:

Cause Related:

1. The pilot was not monitoring the aircraft attitude, and the aircraft gradually entered a spiral dive at low altitude.

2. Because of the low altitude, the pilot was unable to effect a recovery, and the aircraft struck the water.

Other:

1. The aircraft was not equipped with shoulder harnesses.

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CESSNA 185F C-GCNW
GOUIN DAM RESERVOIR, QUEBEC
24 JULY 1985

REPORT NUMBER: 85-Q50037 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1600 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	700	430
LAST 90 DAYS	30	30

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The float-equipped aircraft took off from the lake with a 15- to 20-knot head wind. After the take-off at full power, the aircraft remained about 10 feet above the surface of the lake. The speed decreased, and the pilot increased the angle of attack. The aircraft struck trees on the shore and came to rest in a horizontal attitude about 100 feet past the edge of the lake. The aircraft suffered substantial damage, but the two occupants were not injured.

The performance of the aircraft on take-off and in the initial climb were in accordance with the manufacturer's specifications. The aircraft load was also within the allowable limits for weight and centre of gravity.

The lake, which empties through Gouin Dam, is approximately 1,300 feet above sea level (asl). It is oriented southwest-northwest, is 8,000 feet long, and its maximum width is 1,500 feet. In the direction of take-off, the usable distance is 1,300 feet. The trees along the edge of the lake are about 50 feet tall.

In the prevailing conditions, the distance required to take off and fly over a 50-foot-high obstacle is about 850 feet. The pilot manuals which deal with float-equipped flying recommend that, when the distance available in the selected take-off trajectory appears adequate, that distance should be doubled.

The aircraft's indicated airspeed dropped during the initial climb because the wind was reduced by the screen effect of the trees on the shore. Because the pilot was close to the shore and at full power, he attempted to maintain the aircraft in flight. He increased the angle of attack and put the aircraft in a state of slow flight on the back side of the thrust curve. He was unable to correct the situation, and the aircraft struck the trees.

FINDINGS:

Cause Related:

1. The aircraft was put in a state of slow flight on the back side of the thrust curve following a drop in indicated airspeed produced by a decrease in wind velocity caused by the screen effect of the trees on the shore.

2. Because the aircraft was at low altitude and close to the shore, the pilot was unabie to correct the situation.

Other:

-Nil-

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CESSNA 172 C-FXTB
LOUGHBOROUGH INLET, BRITISH COLUMBIA
24 JULY 1985

BRIEF NUMBER: 85-P50034 (Accident)
LOCAL TIME: 1140 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	209	95
LAST 90 DAYS	35	35

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

REPORTED CIRCUMSTANCES:

The pilot was landing his float-equipped aircraft in gusty winds. The aircraft skipped off a wave, then stalled and landed heavily, and the float struts failed.

* * *

CESSNA 180 SKYWAGON C-GGJM
TETACHUK LAKE, BRITISH COLUMBIA
26 AUGUST 1985

BRIEF NUMBER: 85-P50045 (Accident)
LOCAL TIME: 1500 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	700	350
LAST 90 DAYS	-	-

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

REPORTED CIRCUMSTANCES:

The pilot dropped a message from his aircraft to a person on the ground, and, while the aircraft was in a tight left turn at low altitude, the engine stopped. The fuel tank selector was positioned to the left tank; the pilot's operating handbook recommends the "both on" position. The aircraft was forced-landed in a bog, a float dug in, and the aircraft flipped over.

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CESSNA 180 C-FHCW
YELLOWKNIFE, NORTHWEST TERRITORIES
21 mi NE
10 SEPTEMBER 1985

REPORT NUMBER: 85-W50049 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1030 MDT
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	700	450
LAST 90 DAYS	250	150

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The float-equipped aircraft was cruising at approximately 1,500 feet above ground level, when the engine stopped. The pilot's efforts to restore power were unsuccessful, and he force-landed the aircraft on a small lake. The aircraft landed hard, the wings broke downwards, the engine broke away from the mounts, and the float structure collapsed. The aircraft remained upright and afloat.

An examination of the wreckage revealed that there was no usable fuel in either of the two fuel tanks, and there was no evidence that fuel had leaked from the aircraft.

The pilot stated that he did not rely on the aircraft fuel gauges as he felt they were inaccurate. Based on the fuel he added prior to this flight and the fuel he calculated that he had used on the previous flight, the pilot estimated that he had more than sufficient fuel to reach his destination; however, he did not measure the amount of fuel in the tanks prior to departure. The pilot had inaccurately calculated the amount of fuel in the tanks prior to take-off.

Following the loss of power, the pilot was not able to reach a suitable landing area and elected to land on a lake, even though he realized that the lake was too small for his aircraft; his only alternative was to land in bush. He intentionally stalled the aircraft onto the water to avoid hitting the far shoreline.

FINDINGS:

Cause Related:
1. The engine lost power because of fuel exhaustion.

2. The pilot did not determine the fuel state of the aircraft prior to the flight.

3. The lake chosen for the forced landing was too small for this aircraft type; however, no other suitable area was available to the pilot.

4. The pilot intentionally stalled the aircraft onto the water to avoid hitting the far shoreline.

Other:
-Nil-

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CESSNA A185E CF-ZIF
RANGER LAKE, ONTARIO
13 SEPTEMBER 1985

REPORT NUMBER: 85-O50074 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1600 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,300	100
LAST 90 DAYS	50	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The Cessna 185 amphibious float-equipped aircraft took off from a hard-surface runway at Elliot Lake, and the pilot did not retract the landing gear. He then flew to Ranger Lake and landed the aircraft on water with the landing gear still extended. The aircraft nosed over on touchdown.

The pilot reported that he was suffering from fatigue during the latter portion of the flight and that he failed to carry out the proper post take-off and pre-landing checks before landing on the lake. The extended landing gear caused the aircraft to nose over on touchdown.

FINDINGS:

Cause Related:
1. Because the pilot was fatigued, he did not complete his post take-off and pre-landing checks to ensure that the landing gear was retracted.

Other:
-Nil-

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PIPER J3C-65 CUB CF-MRS
WHITE LAKE, ONTARIO
16 SEPTEMBER 1985

BRIEF NUMBER: 85-C50081 (Accident)
LOCAL TIME: 1930 CDT
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	7,000	2,000
LAST 90 DAYS	50	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

After take-off from White Lake, the aircraft encountered severe downdrafts as it approached power lines about a kilometre beyond the shore. The pilot turned to avoid the lines and was unable to climb. The wing struck a tree, and the aircraft swung around about 180 degrees, settling almost vertically to the ground.

The terrain south of White Lake is rough, with hills or knolls rising 150 feet to 175 feet above lake level. The wind was gusty from the south-southwest.

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CESSNA 305C C-FTGO
LAC LOUISE, QUEBEC 75 mi N
19 SEPTEMBER 1985

REPORT NUMBER: 85-Q50057 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1530 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOTE LICENCE Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	800	225
LAST 90 DAYS	8	8

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	1	-	-

HISTORY OF THE FLIGHT:

The pilot of the float-equipped aircraft departed Lac Louise at 1430 to pick up a passenger on a lake 18 miles north and return the same day. The following day, a pilot flying in the vicinity spotted the wreckage of the float plane 75 miles north of Lac Louise, in a heavily wooded area. He sent a MAYDAY call, and a helicopter was dispatched to the scene. The aircraft was in an almost vertical position, with its nose pointing down. The pilot and passenger had sustained fatal injuries.

PERTINENT INFORMATION:

The pilot was on a moose hunting expedition, using Lac Louise as a base camp. Before taking off to pick up his passenger, the pilot mentioned that, weather permitting, he would spend the night at another location. The meteorological conditions were suitable for visual flight rules (VFR), and the weather is not considered a factor.

No technical discrepancy, which could have affected the aircraft before the accident, could be found. At the time of impact, the engine was producing power. The attitude of the wreckage indicated that the aircraft struck the ground in a spin to the left.

The estimated weight of the aircraft exceeded the maximum allowable take-off weight by 168 pounds or 7 per cent, and the centre of gravity was 2.2 inches aft of the rear limit. The centre of gravity calculations were made on the assumption that the load was distributed in the most favourable positions, taking into consideration the space available in the cockpit. Any load shift would have moved the centre of gravity further aft. Two fuel canisters, one containing 13 Imperial gallons and the other 5 Imperial gallons, were on board and not secured. The rear seat was not installed, and the passenger, who was seated on one of the canisters, was without a seat-belt. The emergency locator transmitter (ELT) was found in the OFF position.

ANALYSIS:

The cause of the spin could not be determined. However, the centre of gravity beyond the aft limit would have reduced the controllability of the aircraft and would have hindered the recovery from a stalled condition. Furthermore, as neither the fuel containers nor the passenger was secured, they could have moved to the rear of the aircraft in flight, thus compounding the problem caused by the aft position of the centre of gravity. If the ELT had been in the ARM position, it would probably have triggered on impact, and the wreckage could have been located electronically.

FINDINGS:

Cause Related:

1. The aircraft spun to the ground for undetermined reasons.

2. Because the centre of gravity was beyond the aft limit, the controllability of the aircraft was reduced.

Other:

1. The weight of the aircraft exceeded the maximum allowable take-off weight by 168 pounds or 7 per cent.

2. Because the ELT was in the OFF position, the wreckage could not be electronically located.

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CONSOLIDATED VULTEE CORP
STINSON 108-3 C-FHNJ
GRANITE LAKE, ONTARIO
30 SEPTEMBER 1985

REPORT NUMBER: 85-O50078 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1830 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	142	44
LAST 90 DAYS	16	16

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	3	-

SUMMARY REPORT:

Immediately after take-off from a lake, the pilot encountered low overcast cloud and reduced visibility in fog. He made a right turn to land back on the lake but was unsuccessful in aligning the aircraft with the landing area. The pilot flew a second circuit at low speed, low altitude, and with the flaps extended. During the second circuit, the aircraft stalled and crashed into trees on the shore, injuring the pilot and the three passengers.

The investigation revealed no pre-crash aircraft malfunctions or failures.

The pilot had not obtained weather information from any appropriate facility prior to the flight. Analysis of the pilot's statement, the weather forecasts, and the actual reports for the area indicated that the weather was not suitable for visual flight. When the aircraft stalled, it was at such a low altitude that recovery was not possible.

FINDINGS:

Cause Related:

1. The pilot took off in weather that was not suitable for visual flight.

2. The pilot allowed the aircraft to stall while he was manoeuvring to land.

Other:

-Nil-

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PIPER PA-18-150 SUPER CUB C-GHYV
SCOOP LAKE, BRITISH COLUMBIA 10 mi SW
11 OCTOBER 1985

REPORT NUMBER: 85-P50047 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1700 PDT
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,700	1,800
LAST 90 DAYS	350	200

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

During a flight from a hunting camp to the main lodge, the weather deteriorated, and the pilot decided to land on a lake and wait for the weather to improve. One hour later, the local weather had improved, and the pilot decided to continue the flight. He started the engine, selected carburettor heat on, and taxied to the edge of the lake. He then turned the heat off and spent a few minutes adjusting his seat before commencing take-off. With one notch of flap selected, the aircraft accelerated and lifted off normally. Shortly after, the engine rpm decreased to 2,300, and the pilot found that he was unable to maintain a climb. The pilot then selected full flap in an attempt to clear trees on the edge of the shoreline immediately ahead of him. The aircraft descended, struck the trees and came to rest on the ground in a near vertical position. The occupants exited the aircraft with difficulty.

The lake, which is 5,000 feet long and 2,000 feet wide, is located at an elevation of 3,750 feet above sea level. Although precipitation at the time included snow and sleet, it was not adhering to the wings or control surfaces and was not considered a factor in the inability of the aircraft to climb above the trees. The ambient atmospheric conditions were, however, ideal for the formation of carburettor ice with an outside air temperature of zero degrees Celsius and a humidity level of 100 per cent. Carburettor ice had been encountered by the pilot earlier in the day. The drop in engine rpm, the ambient atmospheric conditions, and the absence of any known deficiency with respect to the engine or fuel supply system support that carburettor ice was encountered during take-off. Although the pilot used carburettor heat during the water taxi, he selected the heat off several minutes prior to the actual take-off. The absence of heat during this time allowed ice to form and to continue to form even with the high take-off power setting. The drop in rpm degraded the climb performance of the aircraft sufficiently to prevent the aircraft from clearing the obstacles at the end of the lake

FINDINGS:

Cause Related:
1. The pilot was unable to clear obstacles at the end of the take-off area when the climb performance of the aircraft could not be maintained because of a drop in engine rpm, which resulted from carburettor ice accumulation.

Other:
-Nil-

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LAKE LA-4-200 CF-BVM
ROSSVILLE, MANITOBA 1 mi N
11 NOVEMBER 1985

REPORT NUMBER: 85-C50092 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1847 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	16,070	155
LAST 90 DAYS	120	12

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	1	-	-

HISTORY OF THE FLIGHT:

The pilot and his son departed Neepawa, Manitoba bound for their home town of Thompson, Manitoba, with a scheduled fuel stop at Norway House. Approaching Norway House at 1811, the pilot contacted Thompson Flight Service Station (FSS) and received the Thompson weather, which was visual flight rules (VFR) conditions with a visibility of 10 miles in light snow. At 1825, the pilot advised the FSS that he had landed at Norway House and again requested the Thompson weather, which had not changed. Fifteen minutes later, having fuelled the aircraft from containers carried on board, the pilot radioed Thompson that he was taxiing for runway 23. Shortly thereafter, the FSS relayed a special weather report for Norway House, filed at 1833, which indicated precipitation ceiling 1,500 feet, sky obscured, and visibility two miles in light snow. The pilot reported airborne at 1842, then requested and received a special VFR clearance to depart the control zone. The aircraft crashed on a frozen lake, about four miles north of Norway House Airport, killing the pilot and passenger.

PERTINENT INFORMATION:

Most of the pilot's recent experience consisted of day VFR flights in single-engine aeroplanes in northern Manitoba. He had received some instrument training over the years but did not obtain an instrument rating.

The area forecast (FA) for the Norway House-Thompson region, issued at 1130 and valid from noon to midnight, included a few snow ceilings at 800 to 1,500 feet and a visibility of two to five miles with visibilities further reduced by snow-showers to one-half to one mile in the lee of larger lakes. The outlook was for marginal VFR conditions. The FA issued at 1730, valid from 1800 to 0600, called for a general improvement to VFR conditions but still forecast a few snow ceilings of 500 to 1,000 feet with visibility one to five miles in light snow. The aerodrome forecasts for Thompson and Norway House reflected the above.

Actual conditions reported during the day at Norway House were much as forecast, with variable ceilings and visibilities. At 1800, the ceiling was 2,000 feet, and the visibility was four miles; at 1833, precipitation caused a 1,500-foot obscured condition with a two-mile visibility, which lowered to 700 feet and one and one-half miles by 1854. At the time of departure, the wind was from the southwest at eight knots. The pilot did not request a weather report for Norway House or the forecast en route conditions.

Several residents of Rossville, a small settlement just northeast of Norway House, saw the lights or heard the engine of the aircraft proceeding north at low altitude. Shortly thereafter, an explosion was heard, and fire was spotted on the lake. A search was initiated, but efforts to reach the site that night were thwarted by unsafe ice conditions and poor visibility. The wreckage was located the following morning.

The aircraft was configured for cruise and had struck the ice in about a 30-degree left bank and a slightly nose-low attitude. The heading on impact was 207 degrees, which was the approximate track back to Norway House Airport. The lake's elevation was 712 feet above sea level, which was 18 feet below the aerodrome elevation. The aircraft had bounced, then rolled to an inverted attitude and slid to a stop 590 feet beyond the first impact point. The front seats and seatbelts were wrenched from their mounts, and the occupants were thrown clear of the wreckage. Post-impact fire consumed the mid-section of the fuselage, the area of the fuel system.

Wreckage examination revealed no pre-impact mechanical or structural failures. Damage and wreckage distribution were consistent with a high-speed impact. The emergency locator transmitter (ELT) was stowed in the glove compartment and was switched off.

ANALYSIS:

The weather deteriorated rapidly between the time the aircraft landed at Norway House and the time of the accident. However, the pilot would have been aware of the deteriorating conditions as he requested a special VFR clearance. As the aircraft headed north, beyond the lights of Rossville, the pilot probably lost visual reference with the ground. The impact attitude suggests that he either initiated a return to the airport but did not monitor the altimeter, or he became disoriented. In either case, he did not maintain terrain clearance.

FINDINGS:

Cause Related:
1. The cause of this accident could not be determined.

Other:
1. A night special VFR flight was initiated in rapidly deteriorating weather conditions.

2. The pilot did not obtain updated weather information for the last leg of the flight.

3. The ELT was not armed.

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TAYLORCRAFT BC12-D C-FECL
MAISY MAE, YUKON 8 mi NW
15 DECEMBER 1985

REPORT NUMBER: 85-W50071 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1330 MST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	93	93
LAST 90 DAYS	3	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot was on a local recreational flight and was demonstrating negative G flight to the passenger. Shortly after the demonstration, the engine lost power. The pilot selected carburettor heat but was unable to restart the engine, and a forced landing was carried out on a creek bed.

The pilot suspected carburettor icing may have caused the power loss and felt that the carburettor heat system on his aircraft was inadequate. He could only get a drop of 25 to 50 rpm on application of carburettor heat, whereas 75 to 200 rpm is specified in the operator's manual. The relative humidity at the accident site was not known, but the temperature and dew point of -9 and -10 degrees Celsius respectively at Dawson City, 60 miles to the north, would not be conducive to serious icing.

It is possible that the application of negative G during the demonstration created an interruption in the flow of fuel to the engine. If carburettor icing was present, then this may have caused the power loss or may have compounded the problem once the fuel was interrupted by the application of negative G. However, neither of these possibilities could be confirmed.

FINDINGS:

Cause Related:
1. The engine lost power for undetermined reasons.

Other:
-Nil-

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CESSNA 185F C-GAEH
ST PAUL'S RIVER, QUEBEC
04 JANUARY 1986

REPORT NUMBER: 86-Q60015 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1100 AST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	550	480
LAST 90 DAYS	20	20

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The pilot was landing his ski/wheel equipped aircraft on a frozen section of the St. Paul's River, Quebec. The aircraft landed hard, and the left landing gear collapsed. The left wing tip contacted the ice surface, and the aircraft slid to a stop.

The selected landing area was snow covered, and the surface was uneven due to numerous small snowbanks. The pilot reported that, at the time of the accident, there was a cloud base at 500 feet above ground and the visibility was one to two miles in snow and blowing snow. The weather at Lourdes-de-Blanc-Sablon, 20 miles east of the accident site, was reported to be 300 feet obscured with a visibility of one-quarter of a mile in snow and blowing snow.

The overcast sky conditions combined with the blowing snow would have been conducive to whiteout conditions. Because the pilot's depth perception may have been severely restricted by the whiteout conditions, he may have misjudged his height at round-out and landed hard. In addition, the whiteout conditions would have made it difficult for the pilot to discern the rough condition of the landing surface.

FINDINGS:

Cause Related:
1. The pilot attempted a landing in marginal weather conditions and, as a result, landed hard.

2. When the aircraft was landed hard on the rough surface, the left landing gear collapsed.

Other:
-Nil-

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STINSON 108-2 CF-WJK
CHATHAM, NEW BRUNSWICK 62 mi NW
08 JANUARY 1986

REPORT NUMBER: 86-A60002 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1100 AST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,200	3
LAST 90 DAYS	50	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot and one passenger were en route from Moncton, New Brunswick to Grand Falls, New Brunswick at a cruising altitude of 4,000 feet above sea level (asl). One hour after take-off, the pilot moved the fuel gauge switch from the left tank position to the right tank position. One-half hour later, the engine suddenly stopped. The pilot was unable to restart the engine, and the aircraft crashed into a heavily wooded area. A successful emergency locator transmitter (ELT) search was conducted by a military helicopter.

The aircraft is equipped with two fuel tanks and fuel supply is controlled by a three-position fuel selector valve (left-right-off). There is one fuel gauge for both tanks, and the quantity for each tank is found by moving the fuel gauge switch either to the left or the right.

The pilot had received an hour and a half check-ride from the previous owner, four days prior to this flight. The pilot had read part of the owner's operating manual prior to this flight, but had not read the section pertaining to the fuel system.

Examination of the fuel tanks revealed that the left tank was empty and that the right tank was full. It was determined that the pilot had used the fuel gauge switch instead of the fuel selector valve to switch the fuel supply from the left tank to the right tank.

The evidence suggests that even though the previous owner had briefed the pilot on the operation of the fuel system during the check-ride, the pilot did not fully comprehend the operation of the system.

The following technical report was completed:
A60002T1-ELT Analysis.

FINDINGS:

Cause Related:
1. The engine stopped due to fuel starvation, because the left fuel tank was allowed to run dry.

2. The fuel gauge switch instead of the fuel selector valve was used to select the fuel supply.

3. The pilot was not familiar with the operation of the fuel system.

Other:
-Nil-

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PIPER J3 CUB CF-LBS
GRINDSTONE POINT, MANITOBA
22 FEBRUARY 1986

REPORT NUMBER: 86-C60010 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1730 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	140	40
LAST 90 DAYS	10	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The aircraft departed Arborg, Manitoba on a visual flight rules (VFR) sightseeing flight. One hour and 30 minutes later, as the aircraft was circling Grindstone Point at 500 feet, a complete loss of engine power occurred. A forced landing was carried out into a stand of trees.

Large amounts of rust and ice were found in the sediment bowl of the fuel system. A screen (P/N 750272) which normally is located on top of the bowl was not found. This screen is designed to prevent contaminants in the fuel system from entering and blocking the carburettor. Normal maintenance had been carried out on the aircraft; however, the reason the screen was not in place could not be determined.

As no screen was in place, contaminants in the fuel system interrupted the fuel flow to the engine and caused the power loss.

FINDINGS:

Cause Related:
1. The engine power loss was due to contamination in the fuel system.

2. The sediment bowl screen was missing.

3. The forced landing was carried out over a forested area.

Other:
-Nil-

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CESSNA A185F SKYWAGON C-GCAP
HARCOURT, ONTARIO
03 APRIL 1986

BRIEF NUMBER: 86-O60014 (Accident)
LOCAL TIME: 1230 EST
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,187	687
LAST 90 DAYS	13	13

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

The pilot landed the ski/wheel equipped aircraft on a private gravel runway. During the landing roll, the wheels sank into the soft surface until the skis contacted the runway. The skis dug in, and the aircraft nosed over.

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CESSNA A185F C-GBRK
LA PLAINE, QUEBEC
26 APRIL 1986

REPORT NUMBER: 86-Q60014 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1815 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	762	89
LAST 90 DAYS	3	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The float-equipped aircraft was cruising at 1,500 feet above ground level (agl), when the engine suddenly stopped. The aircraft was overflying the village of La Plaine and was not within gliding distance of any water surface. The pilot began a gliding descent and, at 500 feet agl, observed a sandy road running in the direction of the wind. As he aligned the aircraft on final to land on the road, he found that he was in a tail wind. During the final approach, he overflew some hydro wires, which he cleared by raising the aircraft nose. The approach slope was stabilized, and the aircraft landed on the road. The aircraft bounced, and then touched down in a slightly nose-down attitude about 60 feet further on. The front ends of the floats dug into the sand, and the aircraft cartwheeled, and came to rest 45 feet further on.

There was no evidence of any pre-impact technical malfunctions or mechanical failures. Furthermore, the pilot stated that he had found no indication of fuel contamination during his pre-flight check. However, he did not check the amount of fuel in each tank. The aircraft had flown a total of three hours and five minutes since the last fill-up. Following the accident, it was not possible to measure the exact quantity of fuel the two tanks had contained, since the fuel had spilled and spread over the sand. On the basis of the traces of fuel on the ground, the right tank had been empty or had contained only unusable fuel, while the left tank had contained several gallons of fuel before the accident. Furthermore, at the time of the last take-off, the pilot observed that the right fuel gauge was showing about a quarter full and the left gauge more than half full.

During the examination of the wreck, it was noted that the fuel selector lever was in the right tank position. The pilot explained that he did not check the fuel selector position, since he always left it in the BOTH position, that is, he always drew fuel for the engine from both tanks. The pilot reported that he did not change the fuel selector position after the engine stopped.

In a case where it is necessary to make an emergency landing on firm ground, the pilot's operating manual recommends that full flap (40 degrees) be used, that the aircraft be landed in a cruise attitude, and that the column be pulled fully back after the floats have touched down. The pilot used 20 degrees of flap during the landing.

The engine stopped because of fuel starvation when the contents of the right fuel tank were exhausted. Since the pilot did not check the fuel selector position and never touched it, it is probable that he was unaware of this alteration. It was impossible to establish when and why the fuel selector position was changed. However, on the basis of the estimated quantities of fuel at the time of the accident, the engine would have operated for about 1 hour and 35 minutes on the right tank. This would explain the considerable difference between the amounts in each tank.

Since the engine stopped suddenly as the aircraft was overflying the village, the pilot was obliged to spend a great deal of time in finding an appropriate landing place. When he saw the road, he was already too low to make a circuit to order to land in the wind. He was therefore obliged to land with a tail wind.

Furthermore, it was necessary to alter the approach slope on short final in order to clear electric wires across the final approach. After clearing this obstacle, the pilot no longer had enough time and altitude to apply full flap and restablize his approach. The landing was considerably affected by this and was therefore difficult to complete successfully. During the initial touchdown, the aircraft was probably travelling too fast, and, when the pilot pulled the column completely back, it took off again. When it touched down for the second time, the speed had decreased, but, since the elevator was less effective, the pilot did not succeed in rounding out sufficiently to touch down in a level attitute. The front ends of the floats dug into the sand, and the aircraft cartwheeled because of the resulting rapid deceleration.

FINDINGS:

Cause Related:

1. Since the fuel selector lever was in right tank position, the fuel in the right tank was exhausted, and the engine stopped suddenly because of fuel starvation.

2. The pilot did not check the fuel selector lever position during the take-off checks.

3. The pilot was obliged to alter the approach slope on short final in order to clear obstacles; this manoeuvre complicated the landing.

4. At the time of landing, the aircraft was in slightly nose-down attitude; the front ends of the floats dug into the sand and the aircraft turned over.

Other:
-Nil-

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CONSOLIDATED AERONAUTICS INC.
LA-4-200 C-GJSU
DEBERT AIRPORT, NOVA SCOTIA
04 MAY 1986

REPORT NUMBER: 86-A60012 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1855 ADT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,000	Unknown
LAST 90 DAYS	15	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot departed from his lake-side ramp, retracted the landing gear on his amphibious aircraft and flew a circuit, with a stop-and-go water landing. He then flew to the airport. During the roll-out from the normal landing at the airport, the nose of the aircraft settled onto the runway; the nose gear was not extended.

Although the pilot had observed the green landing gear down light, he had not visually checked the mirror to ensure that the nose had extended. The nosewheel had been "cocked" in the wheel well, thus preventing the nose gear from extending. It could not be determined how or why the nosewheel became cocked. It is possible that the muddy bottom of the lake interfered with the nosewheel during retraction. The nose gear extended normally when the nose of the aircraft was raised from the runway, and subsequent retraction checks have failed to duplicate the problem.

Cause Related:
1. The pilot did not visually check the nose gear by using the mirror to ensure that the gear was extended.

2. For undetermined reasons, the nosewheel became cocked, thus preventing the nose gear extension.

Other:
- Nil -

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PIPER J3-90 CUB C-FURA
LADY EVELYN LAKE, ONTARIO
16 MAY 1986

BRIEF NUMBER: 86-O60036 (Accident)
LOCAL TIME: 1810 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	475	450
LAST 90 DAYS	10	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

REPORTED CIRCUMSTANCES:

When the pilot was approaching Lady Evelyn Lake for a landing, he observed a layer of surface fog over top of the water. The layer of fog was not thick, and the pilot was able to see down through it. The landing approach was considered normal; the pilot was using an island as a surface reference during the glassy water approach. When the aircraft entered the fog, the pilot lost forward visibility and attempted a go-around. The aircraft stalled, struck the water in a left-wing-low altitude, and came to rest in a submerged inverted position.

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CESSNA 185F C-GJGZ
LAC LA MARTE, NORTHWEST TERRITORIES
06 JUNE 1986

BRIEF NUMBER: 86-W60017 (Accident)
LOCAL TIME: 1900 MDT
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Senior Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,600	25
LAST 90 DAYS	200	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

To prepare for the summer float season, the pilot was practising glassy-water landings. On the first landing, the left float dug in, causing the left and then the right wing to strike the water. The aircraft remained upright.

Most of the pilot's float flying had been on another type aircraft that required a different landing technique.

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CESSNA 172E C-FPLK
ROPE LAKE, ONTARIO
20 JUNE 1986

BRIEF NUMBER: 86-O60051 (Accident)
LOCAL TIME: 1100 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	200	38
LAST 90 DAYS	6	6

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

REPORTED CIRCUMSTANCES:

The pilot landed the float-equipped aircraft on Rope Lake. After touchdown, the pilot realized that he would not be able to stop the aircraft before it struck the shore, and he applied full power and left rudder. During the turn, the aircraft tipped to the right, and the wing struck the water. The aircraft levelled, and the pilot regained control, stopping the aircraft without further incident.

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PIPER PA-18-150 SUPER CUB C-FHCJ
SCHWATKA LAKE, YUKON TERRITORY
02 JULY 1986

BRIEF NUMBER: 86-W60025 (Accident)
LOCAL TIME: 1244 YDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	200	N/A
LAST 90 DAYS	N/A	N/A

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

The aircraft touched down heavily during a glassy water landing. The left float struts collapsed, and the left wing struck the water.

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UNIVERSAL AIRCRAFT INDUSTRIES
STINSON 108-3 VOYAGER C-FRYD
CAPE CROAKER, ONTARIO
26 JULY 1986

REPORT NUMBER: 86-O60061 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1030 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	280	100
LAST 90 DAYS	15	4

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot of the float-equipped aircraft took off from Meaford, Ontario on a short flight to Cape Croaker. Water conditions during the take-off were described as "one-foot chop". The take-off was considered normal. During cruise flight, the pilot noticed that the left front float strut had failed at the float attachment fitting. He continued the flight to his destination and performed a normal landing in water conditions similar to those experienced during the take-off. After landing, when the aircraft began to slow down, the nose dropped, and the engine cowling came to rest on the float spreader bar.

The float fitting failed because of two-way bending overload. No contributory material defects or manufacturing deficiencies were found. The failure was the result of side loads forcing the nose of the left float under the fuselage. This type of force would be experienced if a landing or take-off had a left drift component, particularly if the aircraft track was to the right of the wave direction.

The previous landing was considered by the pilot to have been normal and had been carried out in calm wind and water conditions.

The left float strut fitting had sustained previous damage when excessive side loads were applied. The precise time this occurred was not determined. The fitting, although damaged, remained attached and functional. During the final take-off in light-chop wave conditions and at a point when the wings were supporting the aircraft's weight, the fitting failed and allowed the nose of the float to become detached. During the subsequent landing, the nose of the aircraft, because it was not supported by the front left strut, dropped to the spreader bar as the aircraft's speed decreased.

The following laboratory report was completed
LP 168/86 - Float Strut Attachment Fitting.

FINDINGS:

Cause Related:

1. The float strut and fitting failed because of previous excessive side loading on the floats.

2. When the aircraft landed, it was not supported on the left by the front float strut, and it nosed down, with the engine coming to rest on the float spreader bar.

Other:
-Nil-

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NAHANNI HELICOPTERS LTD.
SIKORSKY S58E (Helicopter) C-GRNW
FORT SMITH AIRPORT,
NORTHWEST TERRITORIES
11 JULY 1985

REPORT NUMBER: 85-W50035 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1336 MDT
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,000	250
LAST 90 DAYS	150	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The helicopter was being air taxied to fuel pumps prior to departure on a ferry flight. Upon reaching the tarmac in front of the fuel pumps, the pilot leaned out of the door to monitor the landing. The aircraft touched down normally on the left wheel then heavily on the main and tail wheels, and the aircraft immediately started a violent rocking motion. The vibrations increased; the main rotor blades severed the tail boom, and the landing gear collapsed. The passenger left the aircraft without assistance, but the pilot was unconscious and had to be carried out of the wreckage.

The investigation established that this type of aircraft is susceptible to ground resonance, which can be defined as a vibration of large amplitude resulting from a forced or self-induced vibration of a helicopter in contact with or resting upon the ground. It was also determined that the pilot, although he was wearing a helmet, was knocked unconscious when his head struck the door frame. It could not be determined if the pilot was incapacitated as a result of the landing or during the ensuing oscillatory motion. The investigation revealed that the passenger, who was also the maintenance engineer on this aircraft, applied the rotor brake after the oscillations had reached a very large amplitude. Rotor brake application is the secondary recovery action which can be taken in case of ground resonance. The primary recovery action consists of immediately lifting off out of ground resonance. This is the recovery technique which would avoid most structural damage, but it has to be used at an early stage of the onset of ground resonance.

The helicopter landed on the left wheel, and, when the right and tail wheels touched down heavily, a resonant frequency was introduced, which resulted in the aircraft entering ground resonance. Either the touchdown or the oscillations caused by the ground resonance were violent enough to knock the pilot unconscious. When the engineer realized that the pilot was not taking any recovery action, he applied the rotor brake. This allowed the aircraft to come to rest on the tarmac, but the oscillations had already caused considerable damage to the landing gear and the tail boom.

FINDINGS:

Cause Related:
1. While the pilot was leaning out the door of the helicopter, the helicopter touched down heavily.

2. The aircraft began a violent rocking motion and entered a condition known as ground resonance.

3. ot was knocked unconscious when his head struck the door frame either during the landing or the oscillations.

Other:
-Nil-

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OKANAGAN HELICOPTERS LTD.
BELL 206B (Helicopter) C-FHTR
WHITE SANDS CREEK,
NORTHWEST TERRITORIES
11 JULY 1985

REPORT NUMBER: 85-W50041 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1700 MDT
OPERATION: Specialty Aerial Inspection, Reconnaissanceand Advertising
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,200	250
LAST 90 DAYS	175	175

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The helicopter pilot was landing at an unfamiliar site on a pipeline right-of-way. The pilot brought the helicopter to a hover over the selected landing area and touched down lightly. While holding power on, the pilot opened the door to check the positioning of the right skid and tail rotor. At that moment, the aircraft moved to the left and pitched back. The pilot reported that she immediately lifted the aircraft into a hover, but the tail rotor had struck the ground. The aircraft became difficult to control, and, when the pilot attempted to land, the main rotor blades struck a tree.

After the occurrence, the pilot indicated a more suitable landing site should have been selected.

FINDINGS:

Cause Related:
1. The pilot selected an unsuitable site for landing.

2. After touching down, the pilot allowed the aircraft to drift, and, as a result, the tail rotor struck the ground damaging the tail boom area.

3. The pilot lifted the helicopter into a hover but the damage to the tail boom made the aircraft difficult to control, and, during the forced landing, the main rotor struck a tree.

Other:
-Nil-

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TRANS NORTH TURBO AIR LTD.
BELL 206B C-FTNT
WHITEHORSE, YUKON 32 mi SW
19 JULY 1985

REPORT NUMBER: 85-W50042 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2020 PDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	5,300	4,300
LAST 90 DAYS	170	165

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

HISTORY OF THE FLIGHT:

The charter helicopter was transporting two geologists with supplies from Whitehorse, Yukon to a remote site. The intended landing area was in a rocky creek at the bottom of a steep-sided, north-to-south mountain drainage. The wind at the landing site was from the north.

A low level reconnaissance was flown from north to south by descending down the sloping drainage. A landing pattern to the north was initiated. During the left turn for the final approach, the airspeed fell to zero, and the helicopter pitched abruptly nose-down. The pilot added full power and attempted to steer toward a flat area in the creek, but as the helicopter was descending too rapidly, it could not clear a rocky ledge on the east drainage wall. The pilot flared the helicopter; however, it landed heavily on its skids. It turned about 30 degrees to the right and then rolled down the slope. The helicopter came to rest on its left side, on a rocky outcropping about 100 feet above the creek.

PERTINENT INFORMATION:

The landing site was in a confined area which was exposed to a northerly downslope wind. This wind condition was localized at the north end of the mountain drainage and dissipated to the south, where the prevailing south-westerly wind took effect. Also the air mass in the area was very unstable; thunderstorms were developing, and this contributed to the strength and gustiness of the prevailing winds.

ANALYSIS:

The pilot stated that the airspeed was 35 to 40 mph prior to turning onto final approach. However, while turning left, the helicopter encountered a change in wind direction, and the airspeed decreased to nearly zero. The helicopter was then at a speed well below translational lift speed, and the power required for the approach increased substantially. The nose dropped, and the helicopter had insufficient power to accelerate or to enter a hover. Large changes in wind velocity are common in mountainous terrain, and this is particularly so when thunderstorms are present. The pilot's selected approach did not leave him a safe overshoot path in the event that he encountered an unfavourable wind shift.

FINDINGS:

Cause Related:

1. The pilot's selected approach did not leave him a safe overshoot path in the event that he encountered an unfavourable wind shift.

2. The helicopter encountered an unexpected wind shift on approach, and there was insufficient power available to overshoot or to land safely.

Other:
-Nil-

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LIFT AIR INTERNATIONAL
HUGHES 369D (Helicopter) C-GHVM
KIMBERLEY, BRITISH COLUMBIA 7 mi NE
24 JULY 1985

REPORT NUMBER: 85-P50033 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1150 MDT
OPERATION: Specialty Aerial Control
DAMAGE: Destroyed
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,800	650
LAST 90 DAYS	140	60

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The helicopter was being used to dip water from a creek and to lift the water 2,500 feet to a holding tank on a mountain top. On the sixth cycle, after the helicopter began lift-off, tail rotor authority was lost. The water bucket was jettisoned, and the helicopter climbed in right spiralling turns. Approximately 400 feet above the creek, the helicopter was manoeuvred into tall trees on the mountainside. Both the main rotor blades and tail section were torn off, and the helicopter fell 70 feet to the mountainside. The pilot, with only minor injuries, exited the helicopter which subsequently exploded and burned.

An examination of the tail rotor section revealed damage that was consistent with water impact. The bending of the blades in the direction of thrust was typical of overloading from the blade advancing through liquid. The tail rotor drive shaft was found to have failed because of torsional overload consistent with sudden stoppage of the tail rotor. The pilot allowed the tail rotor to strike the water at some time during the dipping operations, resulting in failure of the tail rotor drive shaft. The uncontrollable right turns were a direct result of the loss of tail rotor authority caused by the failure of the tail rotor drive shaft.

The pilot wore both a helmet and shoulder harness during all flight operations. On ground impact, the shoulder harness prevented the pilot from being thrown forward into the instrument panel which broke off and cracked the pilot's helmet.

The following laboratory reports were completed: LP 207/85 - Tail Rotor Components; and LP 195/85 - Light Bulb Analysis.

FINDINGS:

Cause Related:
1. The pilot misjudged the helicopter's height, and the tail rotor contacted the water, resulting in failure of the tail rotor drive shaft.

2. Failure of the tail rotor drive shaft caused a loss of directional control.

Other:
1. The pilot received only minor injuries in a serious accident because he was wearing a shoulder harness and helmet.

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AERO ARCTIC LTD.
BELL 206B (Helicopter) C-GRAA
INDIN LAKE, NORTHWEST TERRITORIES
31 JULY 1985

REPORT NUMBER: 85-W50044 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1520 MDT
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,400	1,200
LAST 90 DAYS	110	110

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot landed on lumpy muskeg in a clearing, and, while he was looking rearward out of the right-hand door to ensure tail rotor clearance, the helicopter drifted left. The left skid caught on a moss hummock, and the helicopter rolled to the left. The pilot's corrective actions were not effective, and the helicopter rolled onto its side.

The investigation did not reveal any pre-accident aircraft malfunctions or failures, and weather was not a factor.

FINDINGS:

Cause Related:
1. On landing, the pilot allowed the helicopter to drift to the left while he was looking rearward out the right door, and the left skid caught in the muskeg, causing the helicopter to roll left.

Other:
-Nil-

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LAKELAND HELICOPTERS LIMITED
HUGHES 369D (Helicopter) C-GHVK
SUNDAY LAKE, ONTARIO 15 mi W
2 SEPTEMBER 1985

REPORT NUMBER: 85-O50071 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1815 EDT
OPERATION: Specialty Aerial Photography and Survey
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,600	40
LAST 90 DAYS	200	40

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot was conducting survey operations in an area northeast of Cochrane, Ontario. As the aircraft approached a survey site, one of the white plastic panels used to mark the site was blown into the main rotor. One of the main rotor blades struck and severed the tail boom and tail rotor drive shaft. The pilot was unable to control the helicopter, which then rolled onto its left side and came to rest on the ground.

The panel markers were secured by branches and spikes stuck into the soft ground and by logs laid on top of them. As the pilot brought the helicopter into a hover, the downwash loosened one of the panels and blew it up into the main rotor. The panel caused one of the main rotor blades to droop, and the blade severed the tail boom and tail rotor drive shaft. It was determined that the panel markers were not required for this flight but had been left on location from a previous operation.

FINDINGS:

Cause Related:
1. An inadequately secured plastic panel used to mark a survey site was blown into the helicopter main rotor as the aircraft approached the hover.

2. The panel caused a main rotor blade to droop and sever the helicopter tail boom and tail rotor drive shaft.

3. The helicopter became uncontrollable and rolled onto its left side.

Other:
1. The panel markers were not required for this flight but had been left on location from a previous operation.

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HÉLICOPTÈRES SHERBROOKE INC.
HUGHES 369D (Helicopter) C-GJPP
ASCOT CORNER, QUEBEC
09 SEPTEMBER 1985

BRIEF NUMBER: 85-Q50055 (Accident)
LOCAL TIME: 1215 EDT
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	300	100
LAST 90 DAYS	70	70

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

The pilot had just completed a short ferry flight from the Sherbrooke Airport to his maintenance base. After touchdown, the pilot decided to reposition the helicopter on more even ground. During this manoeuvre, the tail rotor clipped the edge of the roof of a small building, and the pilot landed immediately.

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JAMESON HELICOPTERS INC.
BELL 206B (Helicopter) C-GNPH
DOG LAKE, ONTARIO
24 SEPTEMBER 1985

REPORT NUMBER: 85-O50076 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1900 EDT
OPERATION: Specialty Aerial Inspection
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	185	92
LAST 90 DAYS	92	67

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

The pilot searched unsuccessfully for a clear and level area on which to land. In order to permit his three passengers to disembark, he selected a rocky sloping shoreline that he felt was suitable for landing, without having to place the skids fully on the ground. As the pilot positioned the forward portion of the skids on the sloping ground, the helicopter started to slide backwards. The pilot applied forward cyclic and increased collective pitch in order to become fully airborne. However, the tail rotor struck the water, and the helicopter entered an uncontrollable right yaw. The aircraft came to rest in the upright position parallel to the shoreline and with the right skid resting in one and one-half feet of water. The pilot and the three passengers exited safely.

When the aircraft began to slide backwards on touchdown, the pilot's control inputs were inadequate to bring the helicopter into a stable hover. As a result, the tail rotor contacted the water, the tail rotor drive shaft failed in torsion, and control of the helicopter was lost.

FINDINGS:

Cause Related:

1. Flight control inputs were insufficient to stop the helicopter from sliding rearward and to bring it into a stable hover.

2. When the tail rotor struck the water, the tail rotor drive shaft failed, and control was lost.

Other:
-Nil-

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FIREFLY HELICOPTERS INC.
HUGHES 269B (Helicopter) C-GZLN
PAYNTON, SASKATCHEWAN
09 OCTOBER 1985

BRIEF NUMBER: 85-C50087 (Accident)
LOCAL TIME: 1250 CST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,036	106
LAST 90 DAYS	78	6

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

REPORTED CIRCUMSTANCES:

The helicopter was being flown to assist in a cattle round-up in a community pasture. While flying in a large sweeping circle at an altitude of about 100 feet, the aircraft yawed sharply right. The pilot lowered collective, applied forward right cyclic, and, after a turn of about 360 degrees during which the helicopter descended 40 to 50 feet, the pilot regained control. He attempted to return to level flight and discovered that the engine (Lycoming H10-360-AIA) had lost power. The helicopter settled into the trees in an almost level attitude.

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CANWEST AVIATION LTD
BELL 206B (Helicopter) C-FKWS
HIGH LEVEL, ALBERTA 12 mi W
18 OCTOBER 1985

REPORT NUMBER: 85-W50059 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1350 MDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4,800	4,800
LAST 90 DAYS	300	300

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The aircraft was being ferried from Hay River, Northwest Territories to Red Deer, Alberta with High Level, Alberta the first refuelling stop. About 40 miles out of High Level, the pilot encountered low cloud and visibility reduced in fog, and he decided to land on a road to await improvement in the weather. The helicopter was in the hover, inches above the road, when a main rotor blade struck a power pole. The aircraft landed on the road in an upright position.

The road ran parallel to a power line and then curved to the right between two of the power poles. The pole struck by the rotor blade was within 10 feet of the edge of the road. Other poles along the line were located further from the road.

The pilot was aware of the power line, but he had not noticed the pole close to the road because of reduced visibility in fog and low ambient light.

FINDINGS:

Cause Related:

1. During a landing, in reduced visibility in fog, the main rotor blade struck a power pole.

2. The pilot was aware of the power line's location but did not see the pole because of reduced visibility.

Other:
-Nil-

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CAN-ARC HELICOPTERS LTD.
BELL 206B (Helicopter) CF-HTN
BOSTON BAR, BRITISH COLUMBIA
26 NOVEMBER 1985

REPORT NUMBER: 85-P50051 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1230 PST
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4,900	2,200
LAST 90 DAYS	50	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

While flying at 500 feet above ground level with the auto-relight system turned off, the helicopter encountered an area of severe turbulence and the engine flamed out. The pilot turned 180 degrees to return to a cleared area. During the forced landing, collective was increased to allow the helicopter to clear a tree line. Rotor rpm dropped, and the helicopter contacted the ground at a higher than normal rate of descent.

The airframe fuel filter was removed and examination revealed that one-quarter of the bowl was filled with water. There was no other evidence of water in the fuel system. The engine driven fuel pump, the fuel control unit, and the governor were all bench checked and performed within limits.

During the pre-flight checks, the fuel filter bowl is drained to check for water. The fuel drains from the filter bowl onto a drip pan and then to the ground via a metal tube.

Sufficient fuel must be drained and then gathered from the drain tube for analysis. If only a small amount is drained, it likely would not indicate the presence of water. The volume of water present in the filter bowl indicated it must have been collecting undetected for some time.

Buffeting due to severe turbulence caused water from the airframe fuel filter to be ingested into the fuel line, and, as a result, the engine flamed out. Since the auto-relight system was turned off, the engine did not restart when fuel was resupplied to the engine.

The pilot indicated that the auto-relight system was normally turned off when he operated at low altitude to preclude an engine surge during an autorotation flare. The pilot misunderstood the purpose of the relight system. If an engine automatic restart is unsuccessful, then the normal emergency procedure requiring the throttle to be closed during an autorotation would prevent an unwanted power surge.

The following laboratory report was completed:
LP 7/86 - Fuel Sample Analysis.

FINDINGS:

Cause Related:

1. A large amount of water was present in the airframe fuel filter and was not drained before flight.

2. Buffeting due to severe turbulence caused water from the fuel filter to be ingested, and, as a result, the engine flamed out.

3. Contrary to proper procedure, the auto-relight system was turned off preventing an auto-relight of the engine.

4. The helicopter sustained a hard landing due to rotor rpm decay when collective was increased to clear a tree line.

Other:
-Nil-

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CANWEST AVIATION (1981) LTD
HUGHES 269B (Helicopter) C-FNTP
OKOTOKS AIRPORT, ALBERTA
30 DECEMBER 1985

REPORT NUMBER: 85-W50072 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1515 MST
OPERATION: Specialty Flying Training
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPE	ON TYPE
TOTAL	31	31
LAST 90 DAYS	31	31

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The student pilot, who was flying solo, was attempting a landing on a flat practice area. As the skids touched down, he pulled up on the collective and moved the cyclic forward. The main rotor blades struck the ground in front of the helicopter, and the machine rolled over, coming to rest on its right side.

On touchdown, the student pilot felt that the tail rotor was going to touch the ground, and he moved quickly on the controls. He overcontrolled when he anticipated a tail rotor strike on landing.

FINDINGS:

Cause Related:
1. The student pilot overreacted on the controls when he thought the tail rotor was about to strike the ground, and he lost control of the aircraft.

Other:
-Nil-

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RANGER HELICOPTERS CANADA
ROBINSON R-22 (Helicopter) C-GDIQ
PARTRIDGE POINT HELIPORT
SAULT STE MARIE, ONTARIO 2 mi NW
26 MARCH 1986

BRIEF NUMBER: 86-O60010 (Accident)
LOCAL TIME: 1140 EST
OPERATION: Specialty Flying Training
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	45	45
LAST 90 DAYS	45	45

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

The student was practising circuits on a snow-covered field, two miles northwest of the heliport. On touchdown, the helicopter skid gear broke through the snow crust, and the tail rotor struck the ground. The tail rotor blades, gear box, and drive shaft were damaged.

The field used for training was in the designated helicopter practice area, and the aircraft's weight was below the authorized maximum weight. The crusty snow was about one and one half feet deep, weather conditions were suitable for flight, and the temperature was about eight degrees Celsius.

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RANGER HELICOPTER CANADA
BELL 206B JET RANGER (Helicopter) C-GAHX
DETOUR LAKE ROAD, TWEED TOWNSHIP, ONTARIO
27 MARCH 1986

BRIEF NUMBER: 86-O60019 (Accident)
LOCAL TIME: 1200 EST
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,800	2,500
LAST 90 DAYS	70	70

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

The pilot approached the landing area downwind and had the helicopter in an abnormally high flare angle to slow it down. While the helicopter was still in the flare, the tail skid struck the ground. The helicopter bounced forward and landed hard on the rear section of the skid gear. The pilot inspected the helicopter for obvious damage and finding none, he took off again and hovered about the immediate area to check the controls and control responses. Satisfied that the helicopter was serviceable, he flew it back to home base without further incident.

It was later discovered that the tail boom skin was wrinkled and that the swashplate, located on the main rotor mast, had scraped the forward engine cowling.

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529617 ONTARIO LIMITED (RANGER HELICOPTERS, CANADA)
BELL 206B (Helicopter) C-GOEV
CHIEF LAKE, ONTARIO
06 MAY 1986

REPORT NUMBER: 86-O60029 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1915 EDT
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	5,200	2,300
LAST 90 DAYS	102	40

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

HISTORY OF THE FLIGHT:

The crew of the float-equipped helicopter with dual controls installed departed from the Four Corners heliport (Sudbury) on a local training flight. The company chief pilot occupied the left seat, and a company pilot undergoing recurrent training occupied the right seat. After about 45 minutes of practising airborne emergencies, the helicopter was hovered above the surface of a lake by the company trainee pilot. The chief pilot simulated a tail rotor failure, and the trainee pilot moved the engine throttle to idle and commenced an autorotative landing. As the helicopter descended, it began to drift to the left, and the left float contacted the water. The helicopter rolled to the left, and the main rotor blades struck the water surface. The rotor blades separated from the main rotor mast, and the helicopter came to rest right side up on the water surface.

PERTINENT INFORMATION:

There was no evidence of mechanical failure of the helicopter airframe, engine, or control systems that would have contributed to the cause of the accident.

The trainee pilot was receiving recurrent pilot training in order to operate the helicopter on a company contract. The company training syllabus requires that a pilot be trained to cope with tail rotor failures both in flight and in a hover. To simulate the tail rotor failure in the hover, the pilot trainee brings the helicopter into a hover and then removes his feet from the anti-torque pedals while the check-pilot controls the torque and applies right pedal to swing the helicopter to the right to simulate the failure. After the helicopter swings approximately 90 degrees from the hover heading, the pilot trainee moves the engine throttle to idle, which stops the swing and commences an autorotative landing.

A radio had been installed in the helicopter on the lower left-hand side of the instrument panel, between the left cyclic control stick and the control panel. Movement of the cyclic control stick to the right was restricted because of the radio and the left-seat occupant's right leg.

ANALYSIS:

When the helicopter began to drift left, the pilot was unable to apply sufficient right cyclic control input to stop the drift because of the restricted movement of the cyclic control stick. With the engine at idle, and the helicopter descending from a hover, there was insufficient time to recover from the autorotative landing, and the left float contacted the water while the helicopter was drifting to the left. The helicopter rolled to the left because of the drift, and the main rotor blades struck the water.

FINDINGS:

Cause Related:

1. The helicopter began to drift to the left after a tail rotor failure was simulated while hovering over water.

2. The location of a radio installation in the helicopter restricted the movement of the cyclic control stick to the right, thereby preventing the pilot from counteracting the left drift.

3. The left float of the drifting helicopter contacted the water surface, causing the helicopter to roll left, and the main rotor blades struck the water.

Other:
-Nil-

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FRONTIER HELICOPTERS LTD.
BELL 205 (Helicopter) C-GXNE
SPENCES BRIDGE, BRITISH COLUMBIA 5 mi S
10 JUNE 1986

BRIEF NUMBER: 86-P60026 (Accident)
LOCAL TIME: 2045 PDT
OPERATION: Specialty Aerial Control
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	8,000	1,250
LAST 90 DAYS	50	44

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

REPORTED CIRCUMSTANCES:

The helicopter was engaged in forest fire suppression and had just completed two successful water uplift flights. On the third water uplift, as the helicopter transitioned from hover to forward flight, it struck an unmarked 5/8 inch cable suspended across the river. The cable contacted the windshield then the main rotor blades, causing the helicopter to vibrate violently. The pilot reduced power, and the helicopter settled into the water.

The cable was attached to trees and was approximately seven feet above the water on one side and 20 feet high on the other side. There were high broken clouds, and the wind was from the south at 20 knots. The visibility was 20 miles, and the temperature was 22 degrees Celsius. The pilot had checked the area for obstructions but did not see the cable. During the uplift, the rotor wash sprayed water on the windshield which resulted in some reduction in forward visibility.

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HUGHES 269B (Helicopter) C-GAYM
LAC BEAUREGARD, QUEBEC
14 AUGUST 1985

REPORT NUMBER: 85-Q50044 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1945 EDT
OPERATION: Private
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,200	100
LAST 90 DAYS	3	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot and one passenger were flying in the helicopter to a camp on the west shore of Lac Beauregard. When he arrived at his destination, the pilot hovered 30 feet above ground level (agl) to choose a landing area. During this manoeuvre, the aircraft engine rpm decreased, and the aircraft lost altitude. The main rotor first struck a tree, then the ground, and the helicopter came to rest on its right side on the The pilot/owner, who was also a fixed-wing pilot, had accumulated 55 hours on helicopters as pilot-in-command, including three hours during the previous five months. The terrain around the camp was uneven and inclined at about 25 degrees. The pilot was unfamiliar with the topography. He stated that the winds were calm and that it was hot and humid at the time of the accident. The temperature was 25 degrees Celsius. The weight of the helicopter was 1,629 pounds, which is 2.4 per cent under the maximum allowable weight of 1,670 pounds. The pilot stated that he was hovering above ground effect when he allowed the rpm to drop below 2700.

The manufacturer's flight manual recommends a minimum of 2900 rpm when the aircraft is under 500 feet agl. During the landing manoeuvre, the pilot was preoccupied with the signals given by friends on the ground who were trying to guide him down. He was not looking at the instruments.

The pilot had little recent experience on helicopters. As he was preoccupied with the uneven terrain and his friends' signals during the landing manoeuvre, he allowed the rpm to drop below the minimum allowable level. The aircraft lost altitude before the pilot was able to increase power.

FINDINGS:

Cause Related:
1. The pilot was distracted and had little experience on helicopters, and he allowed the power to drop below the minimum level specified by the manufacturer.

Other:
-Nil-

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SILVER GRIZZLY TIMBER COMPANY LTD.
BELL 206B (Helicopter) C-GIPI
CARLSON INLET, BRITISH COLUMBIA
07 NOVEMBER 1985

REPORT NUMBER: 85-P50050 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1200 PST
OPERATION: Specialty Aerial Survey
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	11,000	3,000
LAST 90 DAYS	2	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS:	-	-	-

SUMMARY REPORT:

The helicopter was approaching a landing area located amongst 150-foot high trees in mountainous terrain, when the main and tail rotors struck a tree. The landing was successfully completed, but the main and tail rotor blades were substantially damaged.

The tree that was struck protruded 30 feet above the general level of the tree-tops and was located just to the right of the planned approach path.

The weather consisted of scattered stratus cloud based at 500 feet with a ceiling of 2,000 feet. Visibility varied from a few hundred yards to half a mile in rain and heavy rain. Rain on the windshield further reduced the pilot's forward visibility.

The location of the landing area in the mountainous tree-covered terrain restricted the pilot's choice of approach direction. The low cloud and rain on the approach, coupled with the rain flow across the windshield, reduced visibility and increased the pilot's workload. The pilot was concentrating on the landing area and did not see the one tree that protruded well above the tree level. The approach and landing was continued although the weather conditions did not permit the pilot adequate visibility to maintain obstacle clearance.

FINDINGS:

Cause Related:
1. The pilot continued an approach and landing in unsuitable weather conditions.

Other:
-Nil-

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BELL 206A (Helicopter) C-GINV
THUNDER BAY, ONTARIO
09 APRIL 1986

BRIEF NUMBER: 86-C60025 (Accident)
LOCAL TIME: 1625 EST
OPERATION: Private Testing
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	165	64
LAST 90 DAYS	35	35

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

The pilot and engineer boarded the helicopter for a local engine-performance test flight. The helicopter was parked on gently sloping wet turf, with the starboard skid upslope. There was a gusting cross-wind from the left at 15 to 20 knots. As the pilot initiated lift-off, the helicopter rolled to the right; the pilot applied left cyclic and down collective, but the helicopter continued to roll, coming to rest on its starboard side.

The pilot reported that the aft end of the starboard skid had mired in a patch of mud during engine warm-up.

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GOVERNMENT OF THE PROVINCE OF ALBERTA
BELL 206B C-FAFM
AGNES LAKE, ALBERTA 6 mi W
27 FEBRUARY 1986

REPORT NUMBER: 86-W60007 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1355 MST
OPERATION: State
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,700	2,500
LAST 90 DAYS	130	130

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

HISTORY OF THE FLIGHT:

The helicopter was being used to transport three employees of the provincial forestry department who were to take samples from preselected trees at remote sites. Shortly after landing at a site on the House River, the left skid broke through the ice. The helicopter, with its main rotor turning at flight rpm, rolled over onto its left side and sustained substantial damage. All of the occupants vacated the aircraft without difficulty. There were no injuries.

The pilot made a distress call, and they were rescued in less than one hour by another helicopter that was in the area.

PERTINENT INFORMATION:

The House River had a moderate current, and there was open water ten feet from where the helicopter landed. Prior to the accident, three other landings had been made successfully at other locations on the House River, and the pilot stated that he had landed at the accident site a month earlier.

The ice on which the helicopter landed had been eroded from below the surface by the river current. Ice at this site varied in thickness from two feet to eight inches with the changes in thickness occurring within a few feet.

ANALYSIS:

The ice surface on which the helicopter landed had been weakened from below by the river current, to the point, where it was too weak to support the weight of the helicopter. The open water close to the landing site should have alerted the pilot to the possibility that the landing surface was less than adequate.

FINDINGS:

Cause Related:
1. The ice thickness at the landing site that was selected by the pilot had eroded from underneath and was insufficient to support the weight of the helicopter.

Other:
-Nil-

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SCHWEIZER SGS-1-26B (Glider) CF-QDZ
ROCKTON, ONTARIO
12 JULY 1985

REPORT NUMBER: 85-O50055 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1600 EDT
OPERATION: Flying Club Training
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	273	30
LAST 90 DAYS	8	6

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

While on a practice cross-country flight, the pilot had to make an off-airport landing when the glider lost thermal lift and was beyond gliding distance of the airport. The wind was from the right, and the aircraft touched down faster than normal on a soft ploughed area on the side of a hill. The pilot lost control of the glider, and it ground looped to the right.

The area selected was unsuitable for the landing. The soft ploughed field combined with the cross-wind and higher than normal touchdown speed caused the pilot to lose control of the glider after landing.

FINDINGS:

Cause Related:
1. The combination of cross-wind, higher than normal touchdown speed, and the condition of the landing area, caused the pilot to lose control of the glider during the roll-out.

Other:
- Nil -

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TERATORN TIERRA II (Ultralight) C-IBUD
KAKABEKA FALLS, ONTARIO
16 JULY 1985

REPORT NUMBER: 85-C55003 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1215 EDT
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Student Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	16	16
LAST 90 DAYS	2	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The student pilot was authorized for a local solo flight. According to the pilot's instructor, the take-off was normal, but the aircraft began to pitch nose up as it climbed. He stated that the aircraft stalled when it was about 100 feet above ground level and pitched nose down. He thought the pilot was carrying out a stall recovery; however, the aircraft continued to pitch nose down and crashed in a nearly inverted attitude, killing the pilot.

Prior to the accident, the instructor had carried out two familiarization flights with other students, using this aircraft. He reported that it operated normally. Before departure of the accident flight, the instructor saw the pilot adjust the pitch trim to the single-occupant position. No evidence of pre-occurrence discrepancies was found, nor was there any evidence in his log book that the pilot had received instruction on stall recognition or stall recovery.

The causes of the stall and the subsequent failure to recover were not determined. The post-stall dive described by the instructor was similar to a loss-of-control phenomenon known as a nose-over dive-in (NODI). NODI can occur if an ultralight's flexible wing deforms in flight. Once deformed, the wing stays in that shape, and the pilot is unable to control the aircraft.

FINDINGS:

Cause Related:
1. For undetermined reasons, the aircraft stalled, and the pilot was unable to effect a recovery.

Other:
1. The post-stall manoeuvre was characteristic of a loss-of-control phenomenon known as a nose-over dive-in.

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ULTRALITE MIRAGE (Ultralight) C-ICBY
TRENTON, ONTARIO, 5 mi SW
24 JULY 1985

REPORT NUMBER: 85-O55012 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2000 EDT
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Student Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	9	-
LAST 90 DAYS	-	-

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot of the ultralight was familiarizing himself with a type of aircraft that he had not flown before. He was making a low pass over the landing strip, when the aircraft suddenly pitched nose down, struck the ground, and came to rest in an inverted attitude.

The investigation revealed no pre-existing mechanical discrepancy. In the type of ultralight on which the pilot had trained, the control stick, which incorporates the throttle, is mounted overhead and is operated by the right hand. In the accident aircraft, the throttle and stick are separate; the throttle is to the left of the pilot and the stick is to the right.

The pilot confused the stick and throttle and moved the stick forward when he attempted to apply power. As a result, the aircraft pitched nose down and struck the ground.

FINDINGS:

Cause Related:
1. The pilot was not familiar with this type of ultralight aircraft.

2. The pilot confused the stick and throttle and moved the stick forward when he attempted to apply power; as a result, the aircraft pitched nose down and struck the ground.

Other:
- Nil -

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ISAACS FURY II (Amateur-built) CF-AAO
THUNDER BAY AIRPORT, ONTARIO
04 AUGUST 1985

REPORT NUMBER: 85-C50067 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1300 EDT
OPERATION: Private Testing
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	640	1
LAST 90 DAYS	7	1

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was completing a test flight in his amateur-built biplane for the purpose of renewing its flight permit. The aircraft was about 40 feet above the runway, when it began to sink rapidly. The pilot applied maximum engine power in order to check the rate of descent; however, the aircraft touched down heavily. The pilot carried out an overshoot, and the tower controller informed him that the aircraft's left main landing gear appeared to have been damaged. The pilot visually confirmed that the gear was damaged and made a precautionary landing. On touchdown, the left main landing gear collapsed. The aircraft veered off the left side of the runway and came to rest in an upright position in the infield.

The reported surface wind was from 50 degrees right of the runway heading at 11 knots. No wind gusts were reported; however, towering cumulus clouds were reported. The air temperature was 24 degrees Celsius. The pilot stated that localized air turbulence had been encountered when he was at about 400 feet above ground level on final approach and that he had increased engine power temporarily to maintain the correct glide path. He did not mention changing his approach airspeed in anticipation of further turbulence. This was the pilot's first flight in this aircraft type, and, as it was a single-place aircraft, he had not received any dual in-flight instruction on it. The towering cumulus clouds and the pilot's encounter with turbulence on final approach indicate the presence of some localized thermal activity; the 11-knot cross-wind may have caused some mechanical turbulence.

FINDINGS:

Cause Related:
1. The pilot, who was unfamiliar with this aircraft type, encountered turbulence on final approach and was not able to control the aircraft's rate of descent to prevent a hard touchdown.

2. The aircraft's left main landing gear collapsed on landing as a result of damage sustained previously, when the aircraft touched down hard on the runway.

Other:
-Nil-

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BIRDMAN CHINOOK 2S (Ultralight) C-IFXP
BOWERY BAY, ONTARIO
04 AUGUST 1985

REPORT NUMBER: 85-O55013 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1330 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	185	77
LAST 90 DAYS	25	25

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was on a local pleasure flight in the float-equipped ultralight aircraft, when the engine stopped. Suspecting fuel starvation, the pilot selected a second fuel tank but was unable to restart the engine. During an attempt to force-land on a small lake, the aircraft struck the top of a tree bordering the lake and fell 40 feet to the ground.

The pilot had inadvertently left one of the fuel tanks shut off. When the engine stopped because of fuel starvation, the pilot switched to the second fuel tank, which contained fuel, but was unable to obtain a timely restart. Insufficient altitude remained for him to reach the selected forced landing area, and the aircraft struck the tree on approach.

The pilot had installed a shoulder harness of his own design in the ultralight. His use of the shoulder harness helped prevent injury in the crash.

FINDINGS:

Cause Related:
1. The pilot had inadvertently left one of the fuel tanks shut off.

2. When the engine failed due to fuel starvation, the pilot was unable to obtain a timely engine restart.

3. The aircraft struck a tree during the forced landing approach.

Other:
1. The pilot's use of a shoulder harness helped prevent injury.

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SCHWEIZER SGS2-33A (Glider) C-GQNI
FOWLER'S CORNERS, ONTARIO 1/2 mi NW
5 AUGUST 1985

REPORT NUMBER: 85-O50058 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1334 EDT
OPERATION: Private Other
DAMAGE: Destroyed
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	20	20
LAST 90 DAYS	10	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The student glider pilot was on his first solo flight. After several minutes of soaring, the glider was observed to level off and then begin a series of three stalls. The glider recovered successfully from the first two stalls, but the nose remained down after the third stall. The glider entered a steep dive and was observed to accelerate to a high airspeed. As the glider approached the ground, the wings failed and separated from the glider. The fuselage struck a tree before coming to rest in an inverted attitude in shallow water at the edge of a lake.

At the time of the accident there were scattered clouds based at 4,500 feet, the visibility was eight miles in haze, the wind was southerly at eight knots, and the temperature was 27 degrees Celsius. Flight conditions were reported as hot and turbulent, and the visibility decreased with an increase in altitude. Because of the visibility decrease, the instructor directed the pilot not to climb above 2,500 feet.

Examination of the wreckage revealed that the aircraft structural failure was consistent with positive overload in that the wings bent upwards and rearwards during the break-up. It is possible that the turbulence and pitching movements, the reduced visibility, or some other phenomenon, encountered during the flight, caused the pilot to become disorientated or incapacitated in some manner so as to affect his perception of the progress of the flight. The fact that the glider remained in a steep dive when, aerodynamically, it would want to climb at high airspeeds, is indicative that the pilot was keeping the aircraft in the dive with control inputs, either purposefully because of his perception of the flight or inadvertently. The overload was the result of an attempted dive recovery, excessive airspeed, or a combination of both.

FINDINGS:

Cause Related:
1. The glider entered and remained in a steep dive for undetermined reasons.

2. The glider broke up in flight because of overload which was the result of an attempted dive recovery, excessive airspeed, or a combination of both.

Other:
-Nil-

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BIRDMAN ATLAS XC (Ultralight) C-IAUJ
MOOSE JAW MUNICIPAL AIRPORT, SASKATCHEWAN 4 mi N
09 AUGUST 1985

REPORT NUMBER: 85-C55004 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 2050 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: None

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	54	.2
LAST 90 DAYS	5	.2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot, who did not have a pilot licence, had accepted an impromptu invitation to "try out" a friend's weight-shift-control ultralight. The friend gave him a pre-flight briefing, and the pilot taxied the aircraft around the field to familiarize himself with the controls. He then took off, intending to land immediately after becoming airborne. However, once airborne, he realized that he could not land without the aircraft colliding with a fence which bordered the field, so he initiated a low circuit back to the field. During the circuit, he changed the engine power several times to avoid first the fence and then a power line. As he approached the field to land, he reduced power again, but the aircraft started to descend rapidly. He reapplied power and shifted his weight far aft in an attempt to climb, but the aircraft continued its rapid descent. The aircraft struck the fence and was substantially damaged when it nosed over beside the fence. The pilot was seriously injured.

The pilot was not familiar with the aircraft and had not received any recognized training on it. As a result, he did not have the knowledge or experience necessary to safely complete the circuit and landing. The pilot stated that, when he reduced power, the aircraft's attitude was nose high, and the aircraft stalled. The evidence confirms the pilot's statement. By shifting his weight aft, the pilot held the aircraft in the stall. Therefore, he was not taking corrective action, and the aircraft struck the ground in a stalled condition.

FINDINGS:

Cause Related:
1. As the pilot was not familiar with the aircraft and had not received any recognized training on it, he lacked the knowledge and experience to safely complete the circuit and landing.

2. When the pilot stalled the aircraft, he did not use the correct recovery technique, and, as a result, the aircraft crashed in a stalled condition.

Other:
1. The pilot was not licensed to fly ultralight aircraft.

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BIRDMAN ATLAS W/S (Ultralight)
NOT REGISTERED
VERMILION, ALBERTA
10 AUGUST 1985

REPORT NUMBER: 85-W55003 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2030 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: None

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	0	0
LAST 90 DAYS	0	0

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The ultralight owner had just purchased the aircraft at an auction sale. He had no previous flight training or experience. At the time of the purchase, the seller informed the new owner that he would have to replace the propeller, which was damaged, and he strongly advised him to take ground training and flight instruction.

Two days later, the new owner started the aircraft up with the intention of taxiing it around. When he advanced the throttle, he decided to take off. He managed to climb to about 60 feet and carry out two turns before losing control of the aircraft and crashing. The pilot was seriously injured.

Although the propeller required replacement, it is not considered to be a factor in this accident. However, the new owner was aware that the aircraft was not fully serviceable. Despite this and a lack of knowledge and experience of ultralight operations, he decided to fly his new aircraft. Once airborne, because of unfamiliarity with the aircraft and with flying in general, he allowed the airspeed to decay, and the ultralight stalled.

Although the aircraft had been built in 1980, it had never been registered as required by regulation which came into effect on 1 July 1985.

FINDINGS:

Cause Related:

1. The owner had neither the knowledge nor the training to safely fly the ultralight.

Other:

1. The ultralight was not registered as required by regulation.

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COLLISION BETWEEN
STITS PLAYBOY SA-3B (Amateur-built) CF-RCA
and JODEL D-11 (Amateur-built) CF-AXF
GUELPH AIR PARK, ONTARIO
11 AUGUST 1985

LOCAL TIME: 1545 EDT
INFORMATION SOURCE: Correspondence Investigation

STITS PLAYBOY SA-3B CF-RCA
REPORT NUMBER: 85-O50803 (Accident)
OPERATION: Private Recreational
DAMAGE: Minor
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,800	600
LAST 90 DAYS	6	6

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

JODEL D-11 CF-AXF
REPORT NUMBER: 85-O50804 (Accident)
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	795	15
LAST 90 DAYS	25	5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

While taxiing near the intersection of the two taxiways adjacent to the button of runway 32, the Stits Playboy struck the rear of the Jodel aircraft which was stationary.

The pilot of the Jodel reported that her aircraft was stopped on the taxiway short of runway 32, waiting for traffic on final to land. After the traffic had landed, she was about to taxi the Jodel onto the runway, when it was struck from behind by the Stits Playboy.

The pilot of the Stits Playboy reported that he had positioned his aircraft on the taxiway approximately 25 feet from the threshold of runway 32. He was holding short and watching the aircraft on final. After the aircraft had landed, he applied power and had moved forward approximately one foot, when his propeller struck the left horizontal stabilizer of the Jodel. The pilot of the Stits was unaware that the Jodel was in front of him.

The pilot of the Jodel broadcast on the air park's UNICOM frequency her intention to taxi; the pilot of the Stits Playboy did not. The taxiway on which the accident occurred is 16 feet wide.

The Stits, which is a tail wheel-equipped aircraft, requires that the pilot steer a zigzag pattern while taxiing to obtain a clear view ahead. However, the narrow taxiway only allows a shallow pattern to be steered; as a result, the pilot's forward visibility could have been restricted, resulting in his not seeing the Jodel.

FINDINGS:

Cause Related:

1. The pilot of the Stits did not verify that the path ahead of his aircraft was clear before taxiing.

2. The Stits aircraft's forward visibility is restricted while taxiing.

Other:

1. The pilot of the Stits Playboy did not broadcast on the air park's UNICOM frequency his intention to taxi.

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ZENITH CH200 (Amateur-built) C-GNWM
MARKHAM AIRPORT, ONTARIO
25 AUGUST 1985

REPORT NUMBER: 85-O50064 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1725 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	780	2
LAST 90 DAYS	6	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The amateur-built Zenith CH200 was on its second flight since construction had been completed. The builder/pilot had flown one circuit, and, on final approach of the second circuit, the canopy opened. The aircraft pitched nose down at about 150 feet above ground and crashed. The pilot's seat-belt and shoulder harness failed at impact.

Pieces of canopy plexiglass were found on the ground 164 feet before the point of impact, indicating that the canopy latch which was designed and installed by the pilot, was of different design and quality than that depicted in the aircraft drawings. The design was faulty in two ways. First, the latch comes out of which would be produced by normal airframe vibration or by being inadvertently nudged by the pilot. Second, once the over-centre latch moves out of position, the air loads on the canopy would assist in retracting the canopy retaining bolt from the canopy ring and the canopy would open. The locking mechanism malfunctioned and allowed the canopy to open.

According to the evidence the aircraft stalled as a result of the loss of lift which occurred when the canopy opened in flight. There was insufficient altitude in which to recover.

FINDINGS:

Cause Related:

1. The pilot had designed and installed his own canopy-locking mechanism, which was of inferior quality and design to that recommended in the aircraft drawings.

2. The aircraft canopy opened in flight because of a malfunction of the canopy-locking mechanism.

3. The aircraft stalled as a result of the canopy opening in flight.

Other:

1. The pilot's seat-belt and shoulder harness failed at impact.

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MITCHELL P38 (Ultralight) UNREGISTERED
NORTH BATTLEFORD, SASKATCHEWAN
4 mi NE
01 SEPTEMBER 1985

REPORT NUMBER: 85-C55006 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1033 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: None

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	25	12
LAST 90 DAYS	3	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot of the unregistered ultralight aircraft took off from his farm strip for a pleasure flight in the local area. It was his second flight of the day. After a flight of about 20 minutes, the pilot returned and circled the field to position the aircraft for landing. While in level cruise flight, the left wing dropped suddenly, and the aircraft spiralled and struck the ground in a steep nose-down and nearly inverted attitude. The pilot was seriously injured.

The pilot had received about 10 hours dual pilot training in 1983 but had not attained solo standards. During this flight, he was not under the supervision of an instructor. The pilot had little recollection of the latter stages of the flight for several days; he remembered later that a severe vibration had occurred and that he had slowed the aircraft, prior to the loss of control. Examination of the wreckage revealed that a lock nut, which secures the propeller shaft and maintains drive belt tension, had loosened in flight, and the severe vibration resulted. It could not be determined why the nut had come loose.

At the onset of the vibration, the pilot attempted to slow the aircraft. It was concluded that a lower power setting and decreased thrust caused by the loosening drive belts resulted in a decay of airspeed, and the aircraft stalled. The pilot was unable to regain control after the stall.

FINDINGS:

Cause Related:

1. For undetermined reasons, the propeller shaft securing nut loosened in flight, resulting in a severe in-flight vibration and reduced drive belt tension.

2. Propeller thrust was reduced because of the loose drive belts.

3. The ultralight stalled when the pilot reduced power and propeller thrust was reduced; control could not be regained.

Other:

1. The pilot did not hold a valid licence for the flight, nor was he under the supervision of an instructor.

2. The ultralight was not registered.

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SKYLARK 43-3B (Glider) C-FZDJ
PENDLETON, ONTARIO
01 SEPTEMBER 1985

REPORT NUMBER: 85-O50069 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1722 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Glider

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	79	7
LAST 90 DAYS	10	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was practising a confined area landing at the airport. During the final stage of the approach and before the aircraft was flared for touchdown, the right wing lightly brushed tree-tops located near the edge of the field. Approximately 12 feet above ground, the left wing tip struck bushes. The aircraft yawed left about 100 degrees and contacted the ground in a left-wing-low, nose-down attitude.

The investigation determined that the pilot had misjudged his altitude during the final approach, and when the left wing tip contacted the bushes, directional control was lost.

FINDINGS:

Cause Related:
1. The pilot misjudged his altitude on final approach, and, as a result, the left wing tip struck the bushes, causing the loss of directional control.

Other:
- Nil -

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SKYTREK SKYSEEKER MK II (Ultralight) C-ICAF
CHANNING, MANITOBA
06 SEPTEMBER 1985

BRIEF NUMBER: 85-C55005 (Accident)
LOCAL TIME: 1145 CDT
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Ultralight Commercial

	INSTRUCTOR		STUDENT	
PILOT	ALL TYPES	ON TYPE	ALL TYPES	ON TYPE
TOTAL	150	20	2	2
LAST 90 DAYS	10	10	2	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

The aircraft drifted left during the take-off roll. As the student pilot was not correcting quickly enough, the instructor took control and lifted the aircraft off in a slight right bank. Just after lift-off, the student applied, in error, hard left rudder to stop the left drift and pulled back on the control column to avoid the trees. The aircraft veered sharply left and struck the trees along the side of the runway. The student had not realized that the instructor wanted control of the aircraft. Both pilots were wearing helmets, and there was no intercom system in the aircraft.

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JODEL D9 (Amateur-built) CF-RTI
CRANBERRY LAKE, NEW BRUNSWICK
2 1/2 mi S
14 SEPTEMBER 1985

REPORT NUMBER: 85-A50026 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1930 ADT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,500	1,350
LAST 90 DAYS	12	12

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

During a local pleasure flight, the engine (Volkswagon Auto Conversion) started to run rough, and the rpm decreased. The pilot selected a road in a wooded area for a forced landing. On touchdown, the right wing caught in the trees on the side of the road, and the aircraft swung around, coming to rest in an upright position.

The pilot had purchased automotive gasoline from a local service station and, using a metal screened filter, had refuelled the aircraft prior to departing on the flight. The service station operator had recently run his fuel storage tank dry before partially refilling the tank with 500 gallons of gasoline.

The investigation revealed that the inline fuel filter on the engine carburettor had become blocked with a fine black contaminant. The partial blockage caused a reduced fuel flow to the engine and resulted in the partial loss of power. It was determined that the contaminant contained iron particles which originated in the service station storage tank. When the 500 gallons of gasoline were dumped into the empty storage tank, the accumulated residue in the bottom of the tank was disturbed and as a result, was introduced into the aircraft fuel supply.

The filter that had been used during refuelling was too coarse and did not filter out the fine contaminant.

FINDINGS:

Cause Related:
1. The partial loss of engine power was due to a blocked inline fuel filter.

2. The inline fuel filter was blocked with a black contaminant containing iron particles that originated in the fuel supplier's storage tank.

3. The fuel filter used by the pilot during refuelling was not effective in preventing fuel system contamination.

Other:
-Nil-

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JUNGSTER I (Amateur-built) C-GTUN
SPRINGBANK AIRPORT, ALBERTA
09 OCTOBER 1985

REPORT NUMBER: 85-W50055 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1419 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	200	0
LAST 90 DAYS	20	0

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

In preparation for the initial test flight on his amateur-built aircraft, the pilot had taken some dual instruction on another tail wheel type. On the run-up to full power, the engine was producing 2000 rpm. The pilot leaned the mixture and was able to obtain 2150 rpm. The mixture control was left at this setting for the take-off. On the day of the accident, his first take-off attempt ended in a ground loop, but the aircraft was not damaged. During the second take-off attempt as the aircraft became airborne, the engine lost power, and the aircraft settled onto a field off the end of the runway and nosed over.

During the engine runs carried out several days before the flight, the pilot noted that the engine was not producing full power as per the engine manufacturer's specifications. The carburettor was disassembled and reinstalled, and the wooden propeller was shortened about two inches. The engine power did not improve; however, the pilot decided to attempt a flight.

Following the accident, the engine was prepared for a test run, and it was discovered that when the fuel was turned on, the carburettor flooded. Once the engine was started, only 2000 rpm could be obtained with the mixture set at full rich. Leaning the mixture increased the rpm to 2250, and the engine would not develop full power at any setting other than a lean mixture setting. It was determined that a loose shaft on the carburettor control linkage resulted in an excessively rich mixture being supplied to the engine.

FINDINGS:

Cause Related:
1. The engine was unable to develop full power except at a lean fuel mixture setting because of a defective carburettor control linkage.

2. The lean fuel mixture resulted in an engine power loss after take-off.

3. The pilot was aware of the engine problem and elected to attempt a flight.

Other:
-Nil-

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CU-NIM GLIDING CLUB
PILATUS B-4-PC 11 AF (GLIDER) C-GXWJ
COWLEY, ALBERTA
15 OCTOBER 1985

REPORT NUMBER: 85-W50057 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1120 MDT
OPERATION: Private Recreational
DAMAGE: Destroyed
PILOT LICENCE: Glider

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	351	351
LAST 90 DAYS	3	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	-	-	-

HISTORY OF THE FLIGHT:

The pilot's goal for the weekend was to obtain a badge of achievement for a Diamond Climb Award; however, the mountain wave condition had not developed. He was dismantling the glider when the tow pilot reported that the wave was now suitable. The glider was reassembled, and the pilot was towed from the strip to commence the flight for the altitude award.

Release from the tow plane was made at 4,000 feet above ground level (agl), and the pilot dove to notch the barograph recorder. Witnesses on the ground observed the glider in a turn. While in the turn, the left wing folded, and the glider fell to the ground in a near-vertical, high-speed dive while rotating to the left. The glider struck the ground in a 90-degree nose-down attitude.

The pilot was wearing a parachute but did not exit the glider and was killed on impact.

PERTINENT INFORMATION:

The lower bolt, normally attaching the left wing to the fuselage, was found on the ground ahead of the cockpit. The centre and right wing attachment bolts were in their proper location; however, the centre bolt did not have a safety pin installed. The safety pin for the left wing attachment bolt was also missing, and neither safety pin was found during the investigation.

After gliders are reassembled at the CU-NIM Gliding Club, it is customary to have the wing attachments and controls double-checked. These checks had been carried out the day before the accident after the glider had been reassembled following an off-airfield landing. The morning of the accident, the glider was partially dismantled and then reassembled prior to the accident flight. At this time, the reassembly of the glider was not checked by another club member.

The barograph was installed in the cockpit behind the pilot's head. The barograph was secured by bungee cords attached to the left and right lower wing bolt handles.

The pilot was wearing proper gear for this flight including a parachute, but he did not exit the glider. The left sleeve of the pilot's sweater was caught in the spoiler handle; however, it could not be determined if this happened before or after impact.

ANALYSIS:

Information as to how far the pilot had progressed with the dismantling was not available, and the procedure used for reassembly was not witnessed by club members at the airport.

Earlier in the weekend, the pilot was asked about his method of securing the bungee cord from the barograph to the handle of the wing attachment bolts, but he indicated that there was no problem because the safety pins were installed. This was the normal area for the barograph installation.

The pilot was enthusiastic about getting the award for the altitude he was attempting to reach. The possibility exists that this desire to achieve his goal was a factor in the double-checks not being carried out and the safety pins not being installed. Without the safety pins installed, the tension on the bungee cord caused the wing attachment bolt to pull out of the left wing attachment bracket, and, as a result, the left wing folded.

When the left wing folded, the canopy separated from the fuselage. This left the pilot open to the outside, yet there was no apparent attempt on his part to exit the cockpit. According to the other club members, it is not difficult to get out of the Pilatus glider, expecially with the canopy off. If the sleeve of his sweater had jammed in the spoiler handle when the wing folded, he may have had difficulty undoing his seat-belt in the time available. There is also the possibility that he was attempting to control the aircraft or that he was surprised and did not have time to react. Examination of the wreckage revealed that the deceleration forces generated by the impact made this a non-survivable accident.

FINDINGS:

Cause Related:

1. The left and centre wing bolts did not have the safety pins installed during assembly.

2. Securing the barograph to the left wing attachment bolt handle, by use of a bungee cord, caused the bolt to pull out of the attachment bracket.

3. The left wing of the glider folded in flight when the lower ring bolt came out of the centre section spar and wing fitting.

4. The pilot was not successful in exiting the glider prior to ground impact.

Other:
-Nil-

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BENSEN B8-M (Amateur-built Gyroplane)
C-GNGT
BRANTFORD AIRPORT, ONTARIO
25 OCTOBER 1985

REPORT NUMBER: 85-O50086 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1700 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	59	24
LAST 90 DAYS	17	17

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The student pilot was practising take-offs and landings in his amateur-built gyroplane. After successfully completing one landing, he took off again, and the aircraft climbed to 150 feet above ground level. There was no indication of abnormal engine operation, but the pilot was unable to gain additional altitude. The pilot turned in an attempt to return to the airport; however, he was unable to maintain altitude and was forced to land on a ploughed field. The aircraft touched down, and, during the landing roll, the right wheel sank into the soft ground, and the aircraft rolled onto its side.

This aircraft is equipped with a tube/ball type airspeed indicator; however, on the climb-out preceding the accident, the indicator did not function. The ball, which rises and falls in the calibrated clear plastic tube, became stuck at the top of the tube for undetermined reasons, and the pilot was unable to determine his airspeed.

Because of pilot inexperience and the inability to determine forward speed, the pilot did not establish the airspeed necessary to ensure an adequate climb.

FINDINGS:

Cause Related:

1. The airspeed indicator was unserviceable.

2. Lacking airspeed information, the pilot was unable to establish the airspeed necessary to ensure a satisfactory climb.

Other:

1. The cause of the airspeed indicator malfunction could not be determined.

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EVANS VP-1 (Amateur-built) C-FBWD
ELK POINT, ALBERTA 6 mi NE
14 NOVEMBER 1985

REPORT NUMBER: 85-W50063 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1330 MST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	121	57
LAST 90 DAYS	3	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was taking off on a local pleasure flight from a private airstrip. Following a normal lift-off, he entered a zoom climb. The pilot stated that when the aircraft was approximately 100 feet above ground level, the engine lost power. As the pilot turned back toward the airstrip, he experienced a rapid loss in altitude and a lack of flight control response. The left wing struck the ground, and the aircraft crashed onto the edge of the runway, seriously injuring the pilot.

Following the loss of engine power, the pilot attempted to return to the airstrip, as he felt the surrounding terrain was unsuitable for a safe forced landing. The evidence suggests that, during the turn, the airspeed decreased, and the aircraft stalled. The pilot was unable to effect a recovery at the low altitude. The investigation established that the pilot did not monitor his airspeed during the turn, and, as this aircraft was not equipped with a stall warning device, the pilot was probably unaware that the aircraft was about to enter a stall.

Inspection of the wreckage did not reveal any pre-existing mechanical discrepancies. However, the pilot reported that he had not checked the fuel quantity prior to take-off. It is possible that if a low fuel quantity did exist, the steep climb attitude following lift-off could have interrupted the fuel flow by introducing air into the fuel lines. A condition such as this could result in engine stoppage. Impact forces ruptured the fuel tank, and, as a result, fuel quantity could not be determined.

The pilot's licence was invalid because the required medical examination had not been carried out.

FINDINGS:

Cause Related:
1. During the climb-out, the engine lost power for undetermined reasons.

2. During a low level turn in preparation for a forced landing, the airspeed decayed until the aircraft stalled.

Other:
1. The aircraft was not equipped with a stall warning device.

2. The pilot's licence was invalid because the required medical examination had not been carried out.

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SKYSEEKER MK II (Ultralight) C-ICXI
CALGARY, ALBERTA
22 APRIL 1986

REPORT NUMBER: 86-W65004 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1630 MDT
OPERATION: Private Ferry
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	100	1
LAST 90 DAYS	1	1

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft, flown by a private pilot, departed in calm wind conditions on a ferry flight. Thirty minutes later, the aircraft was observed making little headway in 30-knot winds and was seen turning about. The aircraft was next observed circling at low altitude near some large trees. Shortly after, the aircraft was found hanging nose-down in the upper branches of a large tree. The pilot was found lying face down at the foot of the tree.

The pilot, who had altered heading because of adverse weather, was unable to recall anything of the flight after turning back. He had not flown for two years and had no ultralight experience prior to the accident flight.

The ferry flight had departed under ideal weather conditions; however, adverse winds, particularly for an ultralight aircraft, were encountered en route. The adverse conditions probably influenced the pilot to turn back and then to land. While circling in preparation for landing, the aircraft struck tall trees. The pilot probably released his harness and was attempting to climb down from the tree when he fell to the ground. The cause of the accident was not determined.

FINDINGS:

Cause Related:
1. The pilot had no current flying experience and had no previous ultralight experience.

2. The pilot encountered strong wind conditions, which exceeded the capabilities of the pilot and of the aircraft.

Other:
-Nil-

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CHRISTAVIA MK-I (Amateur-built) C-GIHU
ARTHUR, ONTARIO 4 mi SE
26 APRIL 1986

BRIEF NUMBER: 86-O60025 (Accident)
LOCAL TIME: 0945 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	500	35
LAST 90 DAYS	25	25

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

The aircraft took off with a five mph tail wind from a private grass field. During climb-out, the landing gear struck a wire fence at the end of the field and was torn off. The aircraft landed straight ahead into a cultivated field. The pilot had previously attempted an upwind take-off, but it was rejected because the aircraft could not clear trees at the south end of the field. The pilot reported that the field was soft.

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BIRDMAN CHINOOK (Ultralight) C-IDELM
PIERCELAND, SASKATCHEWAN
03 MAY 1986

REPORT NUMBER: 86-C65004 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1310 MST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Student Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	40	33
LAST 90 DAYS	25	25

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-
OTHER	-	-	1

SUMMARY REPORT:

The student pilot took off from a residential road in the shelter of houses. The wind appeared to be light from the northwest, so take-off was carried out toward the west. The pilot reported that, as the aircraft started to climb, the wind seemed to gust from a more northerly direction. The ultralight drifted to the left, contacted a power line, then dropped back onto the road. A spectator ran toward the descending ultralight and received minor cuts from contact with the wing.

The flight was not conducted under the supervision of a qualified pilot. The pilot did not report the accident to the appropriate authorities.

The pilot elected to take off from a confined area which restricted his choice of take-off direction and where he could not accurately assess the wind conditions. On climb-out, the cross-wind component increased beyond that anticipated; the pilot lost directional control of the aircraft, and it struck a power line.

FINDINGS:

Cause Related:
1. The pilot inaccurately assessed the wind conditions before initiating take-off from a residential road.

2. On climb-out, the cross-wind was greater than the pilot anticipated, causing him to lose directional control of the aircraft.

Other:
1. The flight was not conducted under the supervision of a qualified pilot.

2. The pilot did not report the accident to the appropriate authorities.

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FISHER FP-101 (Ultralight) C-ICKP
KITSCOTY, ALBERTA 1 mi N
10 MAY 1986

REPORT NUMBER: 86-W65006 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1700 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	200	0
LAST 90 DAYS	30	0

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The private pilot, who was on his first flight, had acquired the unregistered ultralight aircraft the day before the occurrence. He did not hold an ultralight pilot licence and had not received any ultralight instruction. Although a prepared, level strip was readily available, the pilot elected to take off from a grass field, upslope toward a fence 300 feet away. Witnesses observed the aircraft climb steeply and bank to the right. This flight path took the aircraft directly over the pilot's house, where the right wing struck a whip antenna. The aircraft continued to make a gradual descending right turn until it approached a power line at very low altitude. Suddenly, the right bank angle increased, and the aircraft pitched down steeply, striking the ground. The pilot was seriously injured.

An examination of the wreckage found no pre-existing fault with the primary flight or engine controls. The engine choke control was found in the ON position. The contact point on the right wing where it had struck the antenna indicated that no damage had resulted. An air speed indicator was mounted on the instrument panel, but as there was no pitot tube or associated plumbing installed, the indicator was not functional. A new propeller was installed on the recovered engine (Rotax 277), which was then tested. Full-rated thrust was developed, and it was determined that selection of full choke would result in only a 5 per cent loss of power. The pilot did not have any recollection of the occurrence; so he was unable to aid in the investigation.

The reported increase of right bank, followed by the aircraft's pitching down as it approached the power line, indicated that the aircraft stalled when the pilot attempted to avoid a collision with the power line.

FINDINGS:

Cause Related:
1. The pilot did not have any instruction on, or experience with, ultralight aircraft.

2. The pilot selected an unsuitable area for take-off.

3. In an attempt to climb over and turn to avoid obstructions after take-off, the pilot allowed the aircraft to stall.

4. The airspeed indicator was not functional.

Other:
1. The aircraft was not registered.

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B. MEYER BAKENG DUCE (Amateur-built)
C-GHWZ
VICTORIA INTERNATIONAL AIRPORT,
BRITISH COLUMBIA
10 MAY 1986

REPORT NUMBER: 86-P60019 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1102 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	115	6
LAST 90 DAYS	6	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot, who had limited experience on tail-wheel-type aircraft, had just completed one hour of dual instruction in the traffic circuit. She then took off on her first solo flight in this aircraft. The first approach was somewhat erratic, and, on touchdown, the aircraft bounced. It touched down again and swung left. The main landing gear collapsed, and the aircraft came to rest on the fuselage and right wing tip.

The wind velocity at the time of the occurrence was 070 degrees at five knots and was not considered a factor in the accident.

The pilot decided to land after the bounced landing. However, she did not follow the recommended recovery action from a bounced landing, as outlined in the Transport Canada Flight Training Manual, 3rd. Edition. The recommended action is as follows "If the airspeed is low, and/or the bounce is light, apply power to assist in the round-out to prevent the aircraft from stalling".

As a result of the pilot's erratic landing approach, the aircraft bounced on touchdown. Rather than overshoot, or apply sufficient power to regain full control, she allowed the aircraft to swerve following the second touchdown. A ground loop occurred, and the main landing gear collapsed.

FINDINGS:

Cause Related:
1. As a result of an erratic landing approach, the aircraft bounced on touchdown.

2. Incorrect recovery from the bounce resulted in a loss of directional control, and the collapse of the main landing gear.

Other:
-Nil-

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SCHWEIZER SGS 2-33A (Glider) C-GCLH
IROQUOIS FALLS AIRPORT, ONTARIO
24 MAY 1986

BRIEF NUMBER: 86-O60040 (Accident)
LOCAL TIME: 1522 EDT
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Glider

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,311	195
LAST 90 DAYS	16	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

REPORTED CIRCUMSTANCES:

A currency check was being carried out on a qualified glider pilot. Three successful winch launchings had been carried out, each time ending in a normal landing. Following the fourth launch, the aircraft encountered substantial lift in the circuit. The spoilers were extended and the downwind extended to reduce height prior to turning onto final. The aircraft was put into a side-slip to reduce height further, and, when properly positioned, the side-slip was terminated, and the spoilers were closed. The aircraft then encountered heavy sink, lost flying speed, and descended into trees on the airport perimeter.

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NEW BRUNSWICK SOARING ASSOCIATION INC
SCHWEIZER SGS2-33A (Glider) CF-BJH
STANLEY, NOVA SCOTIA
25 MAY 1986

REPORT NUMBER: 86-A60014 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1618 ADT
OPERATION: Flying Club Training
DAMAGE: Substantial
PILOT LICENCE: Glider

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	83	77
LAST 90 DAYS	1	1

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The instructor pilot was at the controls throughout this introductory flight in which the student was receiving his first instruction on the primary effects of the glider controls. A cold front moving through the area was causing some downdrafts, and the entire flight was flown in conditions of moderate turbulence. After turning onto base leg, the pilot deployed the spoilers and initiated a gentle side-slip to avoid overshooting. A high sink rate developed, and the glider descended below the height of electrical power lines which were on the approach path. The pilot cleared the power line by pulling up, but the aircraft then settled into some small trees on the far side. The left wing struck trees, causing the glider to yaw to the left. The glider crashed into a bog 75 feet short of the runway threshold.

The airfield was under heavy cloud buildup at the time of the occurrence. The glider entered a downdraft area at the same time as the pilot initiated the side-slip. This condition set up an excessive sink rate which caused the glider to descend below the height of the power lines. In attempting to climb over the power lines, the pilot traded airspeed for altitude; as a result, the glider stalled and descended into the trees.

FINDINGS:

Cause Related:

1. The glider developed an excessive sink rate when it entered a downdraft area; as a result, the aircraft descended below the height of power lines crossing the approach path.

2. In attempting to climb over the power lines, the pilot traded airspeed for altitude, resulting in the glider's stalling and descending into trees.

Other:
- Nil -

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DUSTER BJ-1B (Amateur-built Glider) C-GZBK
STRAWBERRY LAKES, SASKATCHEWAN
07 JUNE 1986

BRIEF NUMBER: 86-C60044 (Accident)
LOCAL TIME: 1500 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Student Glider Permit

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	71	12
LAST 90 DAYS	3	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

While being aero-towed for take-off, the right wing tip of the glider touched the ground. The glider swung sharply to the right, and attempts to keep it in line with the tow plane failed. The release mechanism was activated without success, and the glider continued to turn to the right. The cable eventually released, but not before it applied sufficient lateral force to cause damage to the nose cone. The fuselage and vertical fin were damaged during the occurrence. The wind at the time was estimated at 10 knots with occasional gusts.

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SCHLEICHER ASW 20 (Glider) C-GBDJ
PENDLETON, ONTARIO 5 mi E
15 JUNE 1986

BRIEF NUMBER: 86-O60046 (Accident)
LOCAL TIME: 1830 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Glider

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	520	75
LAST 90 DAYS	45	45

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

The pilot was completing a cross-country soaring flight and was on descent to his intended destination. He lost altitude too rapidly, decided he could not reach the airport, and selected a field for an outlanding. While circling the field, the pilot continued to try and locate a thermal to gain altitude. During these manoeuvres, the airspeed was allowed to decrease; the glider stalled and entered a spin. The pilot recovered from the spin; however, there was insufficient altitude to clear obstructions bordering the field, and the glider struck a tree on final approach.

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SCHLEICHER ASW-19B (Glider) C-GGMN
SMITH FALLS/MONTAGUE AIRPORT, ONTARIO 5 mi N
28 JUNE 1986

BRIEF NUMBER: 86-O60052 (Accident)
LOCAL TIME: 1710 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Glider

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	522	135
LAST 90 DAYS	28	23

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

On the second leg of a round-robin flight, the pilot had to land in a field because of the lack of thermal activity. During the approach to the selected landing area, the rate of descent was less than expected even with the dive brakes deployed. The aircraft landed too far down the intended landing area, and it could not be stopped before it struck a pile of stones at the end of the 800-foot-long field.

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SYLVAIRE BUSHMASTER II (Ultralight) C-IJOE
ISLAND (NAGASIN) LAKE, ONTARIO
30 JUNE 1986

BRIEF NUMBER: 86-O65004 (Accident)
LOCAL TIME: 2000 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Student Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	35	35
LAST 90 DAYS	-	-

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

While the aircraft was on a local pleasure flight, the engine ceased running. The pilot was unable to reach a satisfactory landing site and force-landed the aircraft into trees.

Silicone sealant had been used to form a seal for a gas tank fitting and a piece of the material had broken off, entered the fuel line, and obstructed fuel flow to the engine.

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POBER PIXIE (Amateur-built) C-GAKL
WHEATLEY, ONTARIO 7 mi E
26 JULY 1986

BRIEF NUMBER: 86-O60060 (Accident)
LOCAL TIME: 1135 EDT
OPERATION: Private Testing
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	267	2
LAST 90 DAYS	5	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

REPORTED CIRCUMSTANCES:

After installing an engine oil cooler to correct a previous overheat problem, the pilot was conducting tests on the aircraft. An engine ground run and one high speed taxi run did not indicate any problems, so the pilot took off on a test flight. At approximately 50 feet above ground level, the engine began to lose power. The pilot tried to turn back to the airport; however, there was insufficient altitude to complete the turn, and the aircraft landed short in a cornfield. There were no faults with the engine.

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MAXAIR SPORT HUMMER MODEL A (Ultralight)
C-IADO
TREMBLAY, NEW BRUNSWICK
27 JULY 1986

REPORT NUMBER: 86-A65001 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1130 ADT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	266	266
LAST 90 DAYS	8	8

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The ultralight aircraft took off from a private airstrip. When the aircraft reached an altitude of approximately 175 feet, the pilot initiated a turn to the right, levelled off, and then attempted another turn to the right. The aircraft became very unstable and would not respond to control inputs to the right. The flight path was toward a double row of electrical power transmission lines; so the pilot decided to force-land into the trees rather than risk crashing into the power lines.

The clevis pin that connects the top right-hand ruddervator cable to the right-hand ruddervator control horn was missing prior to impact. This was the second flight of the day for the aircraft. The first flight was flown by the owner, and he reported that all control functions were normal. A pre-flight inspection was carried out, and the pilot stated that the clevis pin and snap ring were in place. The loss of control occurred when the right-hand ruddervator control system became disconnected. It could not be determined why the clevis pin was missing because neither the clevis pin nor the snap ring was found.

The fastening devices used in the control system of this aircraft are clevis pins secured by metal snap rings. Federal Aviation Administration document, FAR

23.689, Cable Systems, states that clevis pins subject to load or motion and retained only by cotter pins may not be used in aircraft control systems. However, ultralight aircraft do not have to comply with these regulations

FINDINGS:

Cause Related:
1. A loss of control was experienced as a result of the missing clevis pin.

2. It could not be determined why the clevis pin that connects the ruddervator to the ruddervator control horn was missing.

Other:
1. The fastening devices used in the control system of this aircraft are of a type that do not meet the accepted standards for normal category aircraft.

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Annex 1

List of Reports by Aircraft Manufacturer and Type

REPORT BY AIRCRAFT MANUFACTURER AND TYPE

MANUFACTURER	TYPE	REPORT NUMBER	PAGE
AERONCA	11AC	C50060	34
ALON	A2	O60001	65
BAKENG	DUCE	P60019	119
BEECH	18	O50906	24
	19	O50080	54
	24R	O50091	61
	35	O50059	39
	55	C50064	16
BELL	205A1	P60026	103
	206	C60025	104
		O50076	98
		O60019	101
		O60029	102
		P50050	104
		P50051	100
		W50041	95
		W50042	95
		W50044	97
		W50059	99
		W60007	105
BELLANCA	7ECA	C50062	81
		O50065	46
BENSEN	GYRO	O50086	116
BIRDMAN	ATLAS	C55004	109
		W55003	109
	CHINOOK	C65004	118
		O55013	107
BOEING	707200	P64052	3
	727200	P54026	1
BOEING WICH	75	W60006	69
BRITTNORMAN	BN2A3	C60002	66
CESSNA	120	C50097	64
	140	W60031	79
	150	C50095	11
		C60007	11
		O50072	49
		O60043	30
		W60037	81
	152	C50061	16
		W50062	10
	170	A60015	75
		P50052	62
	172	A60016	76
		A60021	7
		C50075	23
		O60011	29
		O60017	72
		O60051	93
		P50029	14
		P50034	83
		P50039	40
		P60903	75

MANUFACTURER	TYPE	REPORT NUMBER	PAGE
CESSNA (cont'd)		Q50060	25
		W50033	32
		W50046	21
		W50070	63
		W60003	67
	180	P50045	83
		P50048	25
		W50049	83
		W50060	58
		W60027	78
		W60032	80
	182	C50082	51
		O50088	58
		O60027	73
	185	C50077	21
		C50085	24
		C60001	4
		C60004	4
		C60021	28
		O50074	84
		O50075	22
		O60014	90
		P50026	81
		Q50037	82
		Q60014	91
		Q60015	88
		W60002	3
		W60017	93
		W60041	8
	188	C50063	15
		C50068	18
		C50069	44
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	210	O50070	48
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		O60904	78
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		P60902	74
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	305	Q50057	85
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		O50904	46
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CHAMPION	7ECA	O50093	64
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ERCO	415	A60009	71
		C50054	33
		C50059	35
FISHER	FP101	W65006	118
GLOBE	GC1	C50088	55
GRUMMAN	G159	O54157	1
	G164	C50072	19
		W50032	12
		W60011	30
GRUMMANAMER	AA5	O60018	71
	G1159	W50906	60
HAWKER-SDLY	HS748	A64006	2
HELIOPOLIS	GOMHOU	C60044	121
HUGHES	269A	C50087	99
		Q50044	103
		W50072	100
	369D	O50071	97
		P50033	96
		Q50055	98
ISAACS	FURYII	C50067	107
JODEL	D9	A50026	113
K&S JUNG 1		W50055	114
LAKE	LA4	A60012	92
		C50092	87
LUSCOMBE	8	C50074	47
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MAULE	M4	A60008	70
	M4R	O50060	39
MAXAIR HUMM	ER	A65001	122
MITCHELL	P-38	C55006	112
NA ROCKWELL	100	O50082	54
		O50801	38
	NA16	P50042	44
PILATUS	B4PC11	W50057	114
PIPER	J3	C50081	84
		C50093	60
		C60010	90
		O50057	38
		O60036	92
	PA12	P50044	51
	PA17	O50067	48
	PA18	O60055	79
		P50047	86
		W50903	36
		W60025	93
	PA22CP	O50084	56
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	PA22TC	W50067	63
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		C50079	50
		O50073	9
		W50043	36
		W50045	42
		W50050	50
	PA30	Q60005	67
	PA31	C60032	5
		O60032	6
		P50027	14
		W60005	4
	PA32	C54030	41
		P60906	77
	PA34	A60004	68
		O50905	52
	PA38	C50057	8
		W50064	10
POLISH ACFT	PZL104	O50085	57
ROBINSON	R22	O60010	101
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SCHWEIZER	126	O50055	105
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SIKORSKY	S58	W50035	94
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SLINGSBY	50	O50069	112
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STINSON	108	A60002	89
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		O50078	86
		O60061	93
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STITS	SA3	O50803	110
SYLVAIRE BU	SHMR	O65004	122
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	85-10-15	W50057	114
	85-10-18	W50059	99
	85-11-12	W50062	10
	85-11-14	W50063	116
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	85-11-24	W50906	60
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	86-04-22	W65004	117
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	85-07-24	P50033	96
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	85-08-10	P50041	43
	85-08-18	P54026	1
	85-08-22	P50042	44
	85-08-25	P50043	20
	85-08-26	P50045	83
	85-10-05	P50044	51
	85-10-11	P50047	86
	85-10-21	W50060	58
	85-10-26	P50048	25
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	85-07-27	C50065	37
	85-08-30	C50074	47
	85-09-07	C55005	113
	85-09-14	C50078	49
	85-09-18	C50079	50
	85-09-21	C50075	23
	85-10-06	C50085	24
	85-10-09	C50086	53
	85-10-14	C50088	55
	85-10-14	C50901	56
	85-11-11	C50092	87
	85-12-07	C50095	11
	85-12-29	C50097	64
	86-01-13	C60001	4
	86-02-22	C60010	90
	86-03-25	C60021	28
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New Brunswick	85-09-14	A50026	113
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	86-04-01	A60008	70
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	85-07-11	W50041	95
	85-07-17	W50040	33
	85-07-31	W50044	97
	85-09-10	W50049	83
	85-09-11	C50077	21
	86-01-12	W60002	3
	86-01-13	C60002	66
	86-02-13	W60005	4
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	85-08-05	O50059	39
	85-08-05	O50060	39
	85-08-11	O50803	110
	85-08-23	O50904	46
	85-08-24	C50073	19
	85-08-25	O50064	111
	85-08-25	O50065	46
	85-08-31	O50070	48
	85-09-01	O50069	112
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	85-09-02	O50071	97
	85-09-07	O50072	49
	85-09-12	O50073	9
	85-09-13	O50074	84
	85-09-15	O50075	22
	85-09-16	C50081	84
	85-09-20	C54035	23
	85-09-24	O50076	98
	85-09-30	O50078	86
	85-10-08	O50905	52
	85-10-12	O50082	54
	85-10-13	O50080	54
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	85-11-25	O50091	61
	85-12-13	O50093	64
	86-01-02	O60001	65
	86-01-19	H60002	27
	86-02-13	C60007	11
	86-03-26	O60010	101
	86-03-27	O60019	101
	86-03-28	O60011	29
	86-04-03	O60014	90
	86-04-09	C60025	104
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	86-04-26	O60025	117
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	86-06-14	O60048	76
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	86-06-20	O60051	93
	86-06-21	O60047	77
	86-06-28	O60052	121
	86-06-30	O65004	122
	86-07-11	O60904	78
	86-07-12	O60055	79
	86-07-16	O60056	79
	86-07-26	O60060	122
	86-07-26	O60061	93
Prince Edward Island	86-05-31	A60015	75
Quebec	85-07-24	Q50037	82
	85-07-31	Q50048	18
	85-08-14	Q50044	103
	85-09-09	Q50055	98
	85-09-19	Q50057	85
	85-11-10	Q50060	25
	86-01-04	Q60015	88
	86-02-12	Q60005	67
	86-04-26	Q60014	91
Saskatchewan	85-07-16	C50057	8
	85-07-19	C50063	15
	85-07-21	C50061	16
	85-08-09	C55004	109
	85-08-10	C50068	18
	85-08-10	C54030	41
	85-08-13	C50069	44
	85-08-23	C50072	19
	85-09-01	C55006	112
	85-09-25	C50082	51
	85-10-09	C50087	99
	85-11-14	C50093	60
	86-01-23	C60004	4
	86-05-03	C65004	118
	86-06-07	C60044	121
	86-07-10	P64052	3
Yukon	85-07-19	W50042	95
	85-07-23	W50043	36
	85-07-27	W50903	36
	85-08-23	W50904	45
	85-11-30	W50067	63
	85-12-15	W50071	88
	86-07-02	W60025	93